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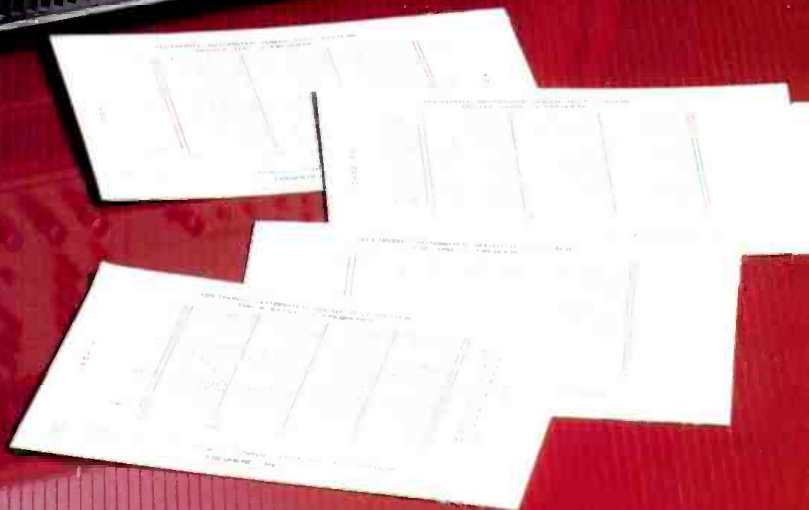
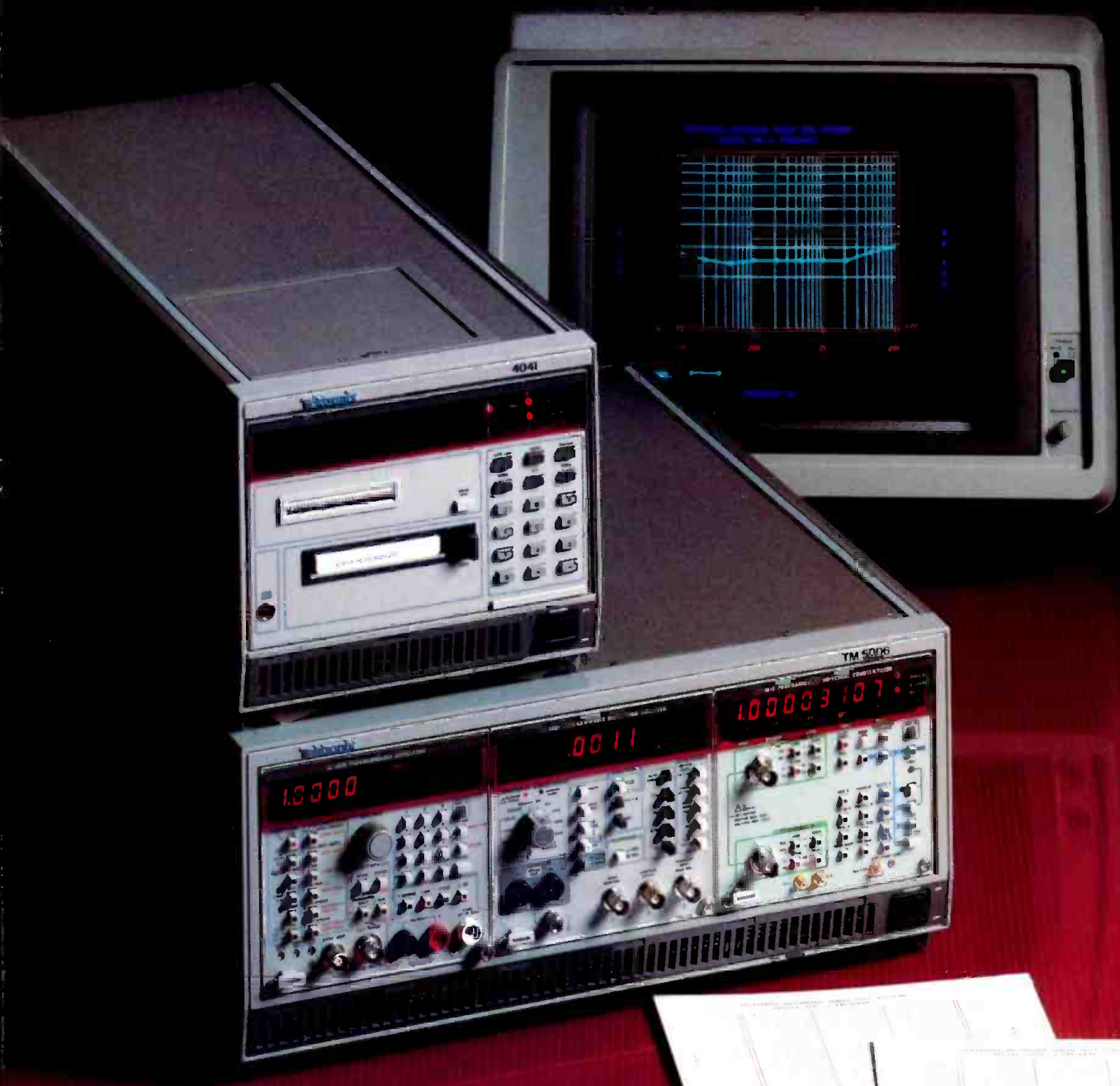


THE SOUND ENGINEERING MAGAZINE



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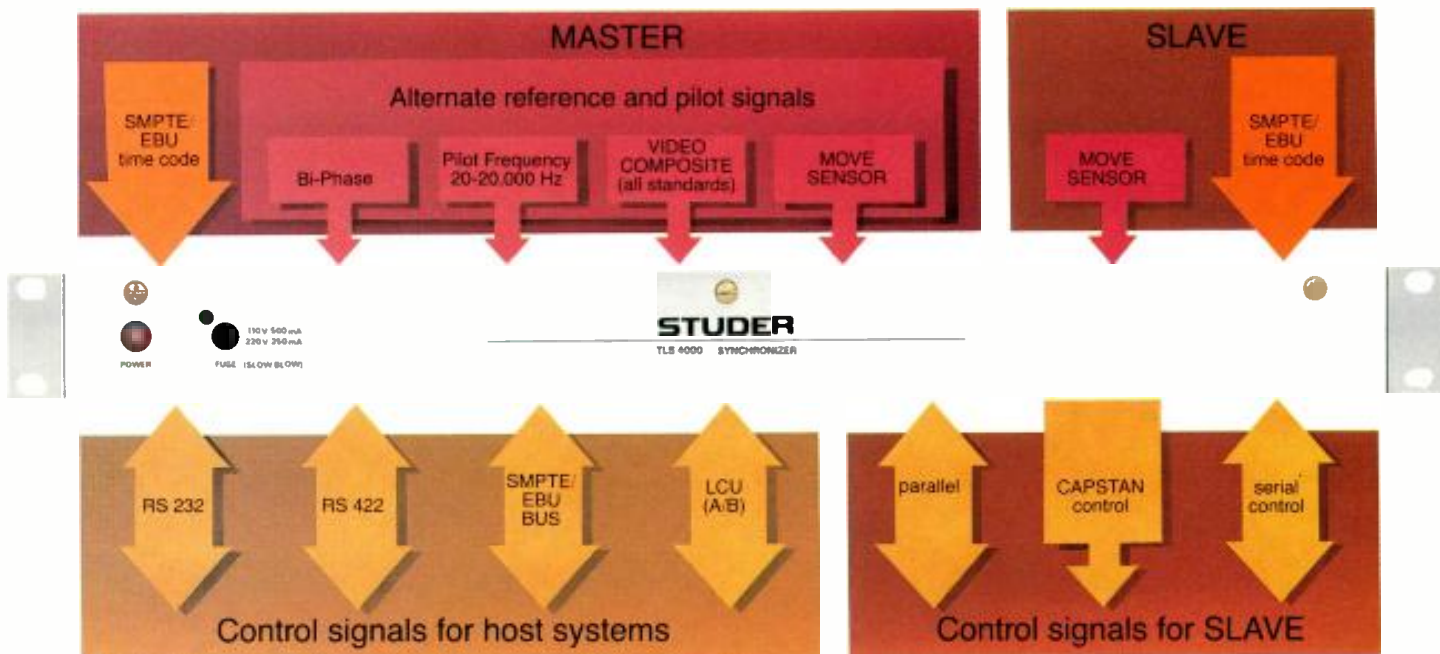
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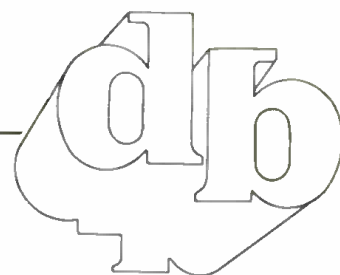
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STUDER REVOX



Top to bottom: Type B LCU, Type A LCU, "black box."

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About The Cover

- This month's cover features the Master Control Room of KABC-AM Radio in Los Angeles, CA, featuring a Pacific Recorders & Engineering BMX Series Console. The cart machines, as well as all the furniture, are also made by PR&E. The tape machine is an MCI 2-track and the monitors are JBL.

WHY BOTHER?

Mr. Blesser.

This letter is in response to your column in the September 1984 db Magazine.

I guess why bother is that maybe we can get the same fun out of establishing workable terms of reference as the pioneers of laboratory experimentation got out of developing the ground work of audio technology.

In the rare instance when someone knows whereof they speak, there is a mentally palpable transmission of right view on a subject. It rings true. This can happen even if the person is speaking a language one does not understand. What you get is a sanity fix. As terms of reference are established to have common and identifiable meaning, then we can come out of the foggy miasma of speculation and bluff and start to deal with certainties.

I find it very encouraging to learn in your articles that there is a concern for this issue, rather than just letting dominant—though possibly

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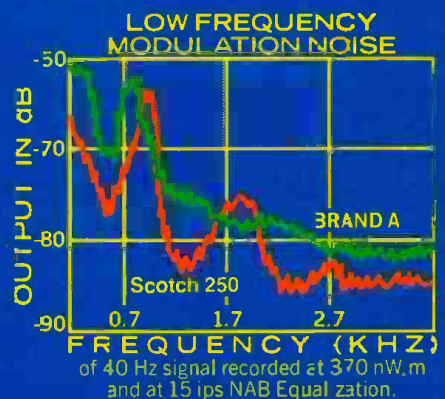
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For you, it's the sixth session of the day. For them, it's the biggest session of the year. So you push yourself and your board one more time. To find the perfect mix between four singers, 14 musicians, and at least as many opinions. To get all the music you heard on to the one thing they'll keep. The tape.

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errant—schools of thought fight for control of the marketplace.

I was grateful as well to find the same careful concern in Richard Heyser's superbly written papers in the AES Journals on the notions of alternative valid frames of reference in modes of thought, perception, and measurement.

When a sense of trust is possible in the reader or listener then there is no need for nit picking or getting bogged down on a particular point. That can come later in an instructive process as terms become understood in context. Primarily it is only necessary to keep reading or listening to catch the drift of intelligence which is inherent in intelligently written material.

Of course there are no hard rules of procedure but when new ways of thinking are the issue then it is necessary to get oriented in the stream of progression.

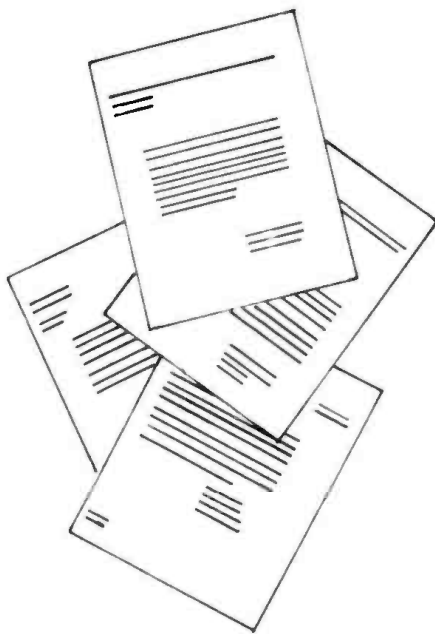
I get the same kind of sensation when for instance Louis Rukyser has a particularly solid guest on Wall Street Week (PBS).

You seem to be operating from a position worthy of trust for people who are interested in the real issues

involved in digital technology. Considering the amount of bullsh-- with which we are deluged in this field, we (and I speak for a few others here) appreciate the chance to read some information from the top.

Thank you for writing "Why Bother?"

DAVID OWEN



you write it

Many readers do not realize that they can also be writers for db. We are always seeking meaningful articles of any length. The subject matter can cover almost anything of interest and value to audio professionals.

You don't have to be an experienced writer to be published. But you do need the ability to express your idea fully, with adequate detail and information. Our editors will polish the story for you. We suggest you first submit an outline so that we can work with you in the development of the article.

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shown with
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AT855

AT853

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AT837

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The World's First All-Digital Studio

• I have just spent a day in the world's first fully comprehensive digital studio, where I soon became convinced that I was "listening to the future." Except for the microphones and the final monitoring amplifiers and loudspeakers, the signals remained in digital form throughout—to give that sealed-in quality which seems proof against all the normal degradations of noise, interference, saturation and phase slips which can attack analogue signals. If the A/D derived numbers are still convertible at the final D/A stage, the signals have been processed *perfectly*. That's how the theory goes.

Many readers will have heard rumours about this installation of Neve's revolutionary DSP (Digital Signal Processing) console in the CTS Studios in London—and the considerable delays which have taken place in getting it on-stream. Since the grapevine we use in the recording industry includes a number of cynics and vested interests, such rumours/signals tend to be amplified if not exactly distorted on the way—and so the world has gotten the idea that Neve's design was full of bugs and that a digital console is both over-expensive and over-complex.

Now that I have seen and heard the finished system, I would say that it is both beautiful and very desirable.

RECENT HISTORY

It all began as far back as 1978 when the Neve engineers, following their successful experiences with computer-assisted mixing consoles (NECAM), began to look at the possibility of handling all programme signals in the digital (PCM) domain. They collaborated with the BBC, who

had built experimental designs, and by late 1981 there was a Neve prototype ready to show to potential customers.

The BBC, in fact, became the first purchasers, ordering a large console to be fitted in the world's first all-digital mobile recording vehicle (see my story in the April 1984 issue). Peter Harris, the Managing Director of CTS Studios, was very impressed by the DSP potential. In early 1982, with Compact Disc just on the horizon and digital recording already an accepted technique in the studios, he decided to take the plunge. Helped by a one-year interest-free loan of £250,000 under a government scheme to encourage investment in British microprocessor technology, he ordered a DSP console at a quoted £310,000 (it would now cost £450,000 or more), and began the long-haul of drawing up detailed specifications and carrying out pre-production trials.

The console finally arrived at CTS Studios in the late summer of 1984, where a great deal of anticipatory work had been going on. The Sony 3324 24-track digital recorder had been in regular use since July, 1983, and Studio 1 had been extensively reconstructed by Eastlake to welcome the new console. Peter Harris had also shown that he can 'think big' by re-equipping the main studio at a total cost of around £600,000.

The combination of all the new ingredients made it quite impossible to programme the software for the control system and keep up with the booked studio sessions. Therefore the DSP console was temporarily moved out of the main control room and run in parallel with the existing analogue Neve desk for several weeks. This

period proved very productive from the point of view of engineer and client familiarisation. Neve engineers almost lived and slept on the premises, completing the custom-design aspects with direct feedback from the users.

During the Christmas 1984 vacation, the console was finally installed in the control room and immediately put to work on a major session. This involved the Royal Philharmonic Orchestra performing the soundtrack music by Maurice Jarre for a new feature film "The Bride." The balance engineer, Dick Lewzey, played part of this to me, (in between sample takes from a live jazz quartet in the studio), and it made a very convincing argument for the idea of processing and storing everything in the digital domain. Orchestral detail was crystal clear, and the total absence of flutter, modulation noise, or any other kind of noise was fantastic.

THE STUDIO

The CTS studio complex, also known as The Music Centre, houses four recording studios with suites for film editing, digital editing and disc cutting. Studio 1 is the largest and can accommodate 130 musicians. It has sourced a great many film scores for James Bond, Superman and Pink Panther series and such award-winners as "Gandhi," "1984" and "A Passage to India." The Centre is also very successful in the pop charts, with hits like the No. 1 album from the Flying Pickets and the best-selling LP of the new stage musical "Chess" with a huge line-up of stars that includes the male half of Abba.

As reconstructed by Eastlake, who

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Neve DSP in Studio One at the CTS Studio Complex.

rebuilt the control room in 1981. Studio 1 is attractive, and unusually lively in these days of claustrophobically dead studios. It is very large, of course, measuring 24 x 14.5 x 10 metres (78 x 48 x 33 feet). Noise level is very low at about NC15 and

the reverberation time had been held to within 10ms of a design curve averaging something less than 1.6 seconds.

Variable acoustics were considered to cope with the range of clients from rock bands to symphony orchestras,

but proper overall design plus arrays of screens have met this requirement in a more practicable fashion. In any case, two very versatile isolation rooms open off the studio. One measures 8.5 x 9 x metres (28 x 29.5 feet), and the smaller L-shaped room is about 4 x 4.5 metres (13 x 14.7 feet).

These isolation rooms (as big as many studios) are separated from the studio by double-glazed glass walls and sliding doors. Since they fit under the control room, special isolation design was needed (monitoring levels of 100 dB are not unknown). This involved isolation walls and an under-slung lead sheet sandwiched between two layers of high-density mineral fibre.

Acoustic treatment in the studio includes 5-metre high bass absorbers effective down to 28 Hz. Technical equipment includes an electrically controlled projection screen which glides up into the sloping ceiling, and playback speakers built into the sloping rear wall. Versatile dimmable lighting schemes were designed for the studio and both isolation rooms.

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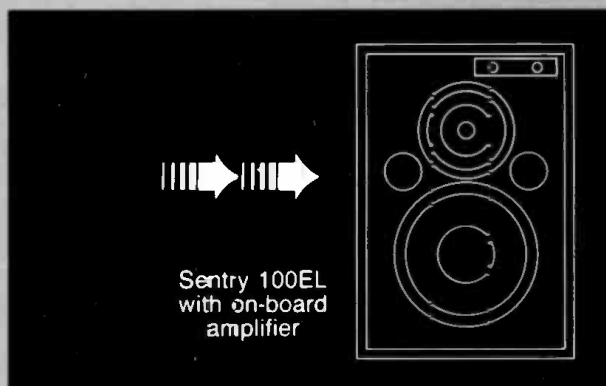
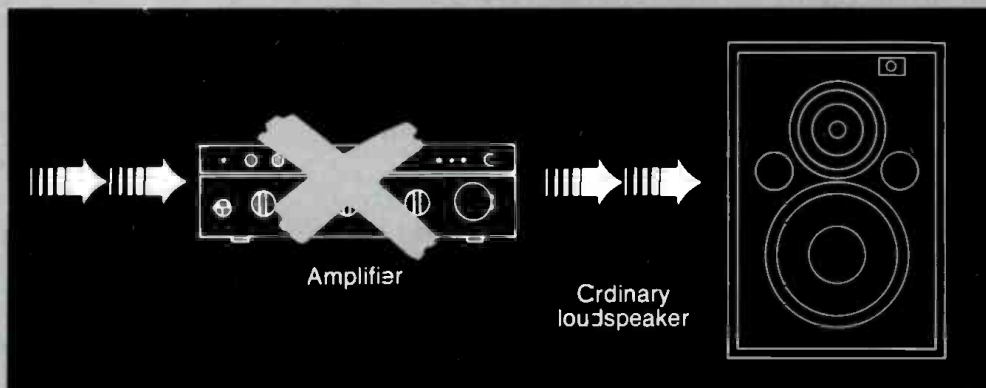
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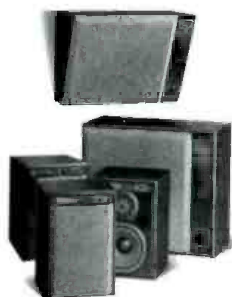
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had also gone out to the Neve factory and been allowed to play on their quite small demonstration prototype. However, on this last visit to CTS with everything up and working, I must admit to being surprised at the overall dimensions of the console. Having just said that a DSP desk can be compact, CTS have chosen a very generous layout spreading over an area of about 4.5 x 1.25 metres (13.7 x 3.8 feet)—mainly to accommodate the film music sessions where more than one engineer may be involved in the mixing.

The long straight portion accommodates 48 channel strips and all related controls, and 32 high-resolution bargraph level meters, plus a producer's position. At the left-hand end, set at an angle, is the monitoring section. Let into the angle so formed is the master control panel with keyboard, main VDU screen, etc.

Despite its large area, the CTS console is of the assignable type; that means that much duplication of EQ controls and so on is avoided. In fact, Neve claims that there would be 1,500 more knobs on an equivalent

analogue console—and privately they have coined the motto "*knoblesse oblige*" for their DSP system.

Each channel strip therefore begins with one of Neve's latest 6-inch travel motorised faders, having touch-sensitive read/write updating as in NECAM. Above this is the four-segment labelling display already mentioned, then a row of three LEDs to show whether the fader is in an input, sub-group or output controlling mode. Next comes the all-important *Access* button which places this channel under individual control by the *EQ* and *Dynamics* panels. These provide variable high-pass and low-pass filters, four-band equalisers and flexible limiter-compressor-expander-noise gates. Finally there are conventional *PFL* and *Solo* buttons, unconventional *Source* and *Soft* buttons which allow switching between the various paths which may have been assigned to that particular fader, or between up to eight possible programmed functions, plus a rocker-type *Muting* key with ON, AUTO and MUTE indicator lamps.

Mounted further away from the operator, and separated by a white band from the channel strips just described, are sets of assignable knobs with their associated display legends. The many functions which these may adopt include *Gain Make-up*, needed for example when compression is taking place and the average level has to be restored to normal. In practice, the operator will normally set the microphone amplifier gains at a level which makes best use of the A/D converters (+34 dB headroom is available). Thereafter the digital signal is extremely tolerant of level setting (up to 32-bit words can be utilised internally) but it makes sense to stay within design limits—easily checked on the monitoring panel. Other functions controlled by these assignable knobs are stereo width, delay adjustable in 1ms steps, aux send levels, pan and auto-fade (in 0.5s steps up to 30s).

OPERATIONAL FEATURES

So far we have described fairly simple features with parallels in many existing analogue consoles. The real advances which the DSP design represents takes us into new realms of operational versatility centered on the control computer and its associated VDU and floppy-disc drive.

Upon switching on, the operator is offered a menu of console status

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"With Gauss, you always know you're getting a professional loudspeaker," Martindale continued, "with XXX (the three letter company), you never know whether the speaker was developed for hi-fi or pro use. The quality just varies all over the place. For my money, Gauss speakers are by far the best speakers I can use."

These comments were unsolicited and made by Mr. Martindale who purchased the Gauss speakers he uses in an elaborate sound system which supports Cinemascope movies, VHS Hi-Fi video, compact discs, stereo TV and "normal" stereo.

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options. He could, for example, insert his own disc to set up the entire console automatically (in about 30 seconds) to the mix and assignment scheme previously established for a given session. Alternatively, he can begin the process of assigning inputs to channels, setting levels, introducing EQ, limiting, panning, etc. from scratch. He is helped in this by various display options which show routing flow diagrams including each of the processors (which he can insert in each channel in any desired order).

The speed with which all this can be accomplished, and the ability to log complete set-ups on disc, enables an engineer to build up a library of console configurations. It also means that the studio can be used more intensively. Daytime and evening bookings can follow one another with little delay and be for entirely different musical recordings, or record/mixdown, etc. in the knowledge that the console re-setting will be quick and fault-free. So it is not necessary to allow lengthy set-up times, or lock up the control room for fear of accidental knob twiddling in the engineer's absence.

Just as multi-mic and multi-track techniques have evolved to give the engineer maximum acoustic control of the musical sounds, so have the processes of sweetening and final mix-down necessitate numerous passes from tape to tape. In every studio in the world but CTS Studio 1, this means working in the analogue domain at least for part of the time—with the too familiar signal degradation that this implies.

The CTS facility now avoids analogue entirely—except where present outboard reverb and other processors have to be used. It also supplies new degrees of remote control, total memory and versatile routing. This single console can be programmed to perform in any one of a host of different console configurations, from controlling up to 72 line inputs to handling complex overdubbing or film-score productions.

The console operates at the 48 kHz sampling frequency recommended by the AES/EBU. However, CTS have a Studer sampling frequency converter and so they can produce CD masters on the recommended Sony 1610 digital recorder at 44.1 kHz to provide an unbroken PCM digital line all the way from the mic amplifiers to the consumer's Compact Disc player D/A converter. Fast self-



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Spacious Studio One during a musician's break at the CTS Studio Complex.

diagnostic software automatically identifies problem areas to avoid expensive down-time.

The obvious pleasure with which CTS engineers and producers have welcomed this first-ever all-digital

console is proof of its viability. The composer Maurice Jarre, a regular customer at CTS, is quoted as saying, "The new facilities of the digital studio mean an incredible improvement in technique. The DSP console

saves so much time in the studio that it actually saves money." Studio rates are £150 per hour, compared with £105 analogue, and clients have already described this as very inexpensive. As for the sound quality, this has been praised all round. Even when the digital master has had to be dubbed to analogue for optical prints, the cleaner, uncluttered sound can still be heard. As a final plus point, users have said that their creativity has been enhanced by the console's novel facilities.

Neve's other on-stream customer for DSP is also in London. The Tape One studios have been operational since May 1984 with a custom-designed two-channel DSP console for digital audio post-production work. CD masters have been produced for numerous clients and to suit the different encoding requirements of individual CD pressing plants worldwide. The latest order to reach Neve is from the National Sound Archive, part of the British Library. It will be used to provide the best possible restoration of archive sound material, as well as processing field recordings made on the Sony F1/Betamax system. ■

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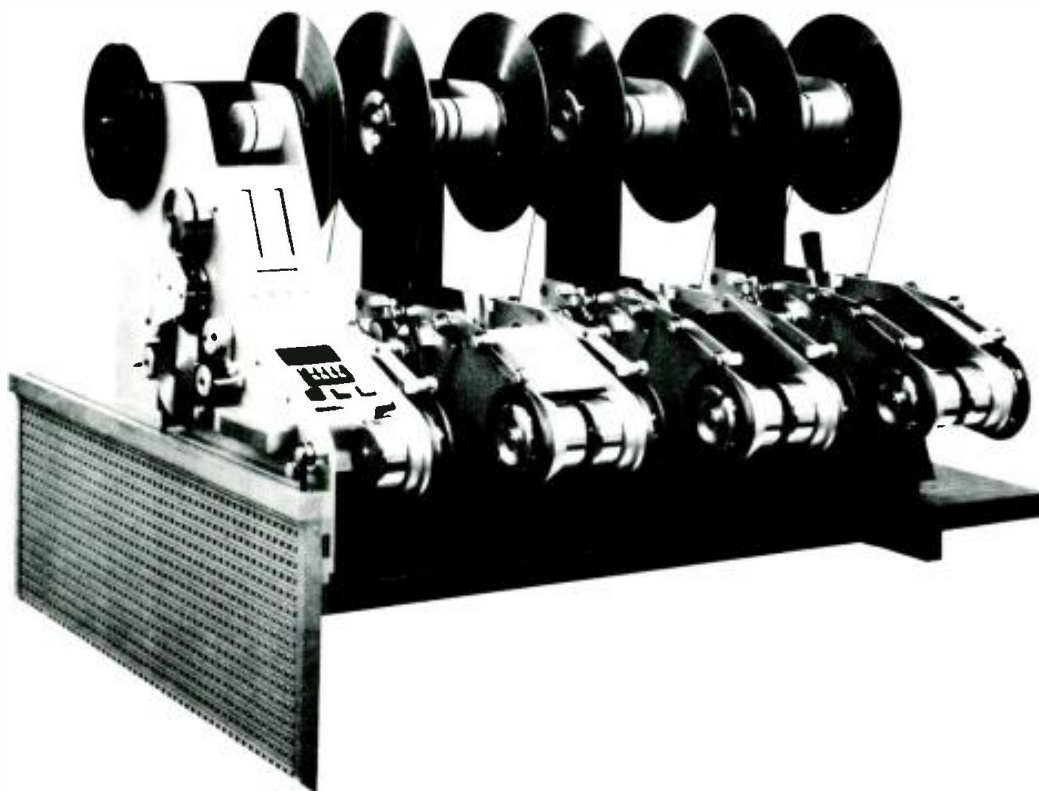
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Analog and Digital Degradations

DEGRADATIONS

• The term degradations is my term for all the mechanisms by which an audio music signal can be technically destroyed or damaged as a result of equipment limitations. This includes the normal concepts such as noise, distortion, non-flat frequency response and the entire collection of terms and measurements. Every author has some pet topics and I must warn you, dear reader, that this is mine.

The attempt to achieve audio perfection has, historically, been

considered an admirable goal. But like many "do-gooders" I can commit my unforgivable sins in the name of good-deeds. Anything carried to an extreme becomes a fetish. [Fetish: an object believed among a primitive people to have magical power to protect or aid its owner; a material object regarded with superstitious or extravagant trust or reverence; an object of irrational reverence or obsessive devotion. (Websters New Collegiate Dictionary)]. In the bad old days of audio, when the pentode was a new invention, degradation consisted only of two measures: noise

and harmonic distortion. With a noise measure, one simply turned off the signal and measured the RMS energy produced by the physically random processes of electron flow. For distortion, the user placed a high level sine wave into the system and measured the energy in the higher harmonics relative to the fundamental. Both measures were clear and a relatively *good predictor* of perceived quality.

In these bad old days, 60 dB of S/N was considered professional quality; and a harmonic distortion of 1% was considered the limit of detection. You

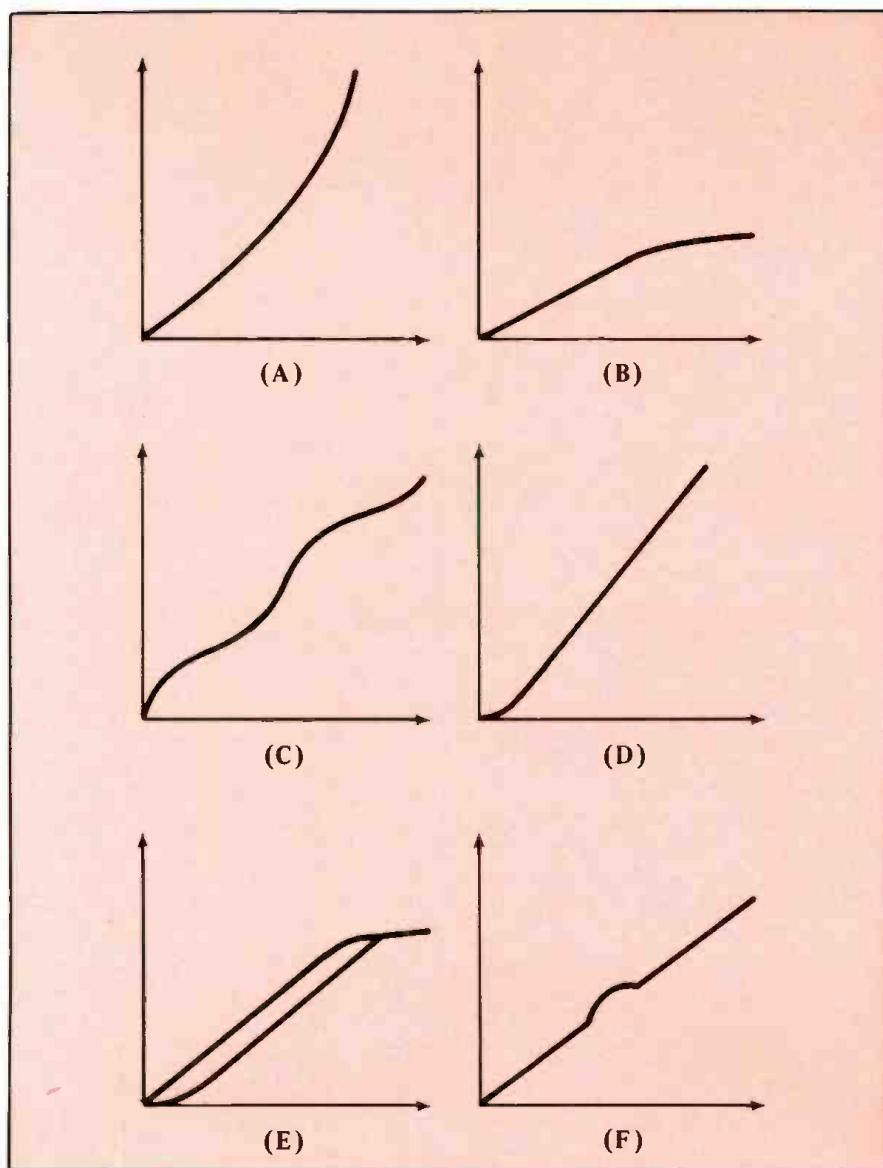


Figure 1. Exaggerated examples of nonlinearity transfer curves: a) simple second order; b) gentle saturation; c) periodic gain variation; d) cross-over error; e) hysteresis nonlinearity; f) gain bump.

may laugh but the old timers used their common sense correctly. They came to these conclusions based on their listening experience with current equipment. More to the point, however, they correctly observed that an amplifier which had 3% harmonic distortion clearly sounded worse than one with 1%. Their scale of measured numbers had a clear relationship to their experience when listening. They were using the measured numbers as a formal way of representing their subjective experience. They had several interesting advantages compared to us new timers. Their noise was always of the same type: gaussian random noise originating from a statistical independent source. Similarly, their distortion was always the simple second and third

order gentle saturation of vacuum tubes. The important conclusion is that there was a consistent alignment of three classes of issues: perceptual experience, technical measure, and physical origin.

As life became more complex, however, the alignment of the three classes broke down. Using common sense, the old timers then tried to create new measures which would work for the modulation noise of tape recorders, amplifiers with complex feedback, and a large group of other equipment. From this effort came such concepts as intermodulation distortion. This stage in the evolution of the field of degradation was less successful. The numbers from such measures did not always predict the perceived quality and it was a function of the type of mechanism

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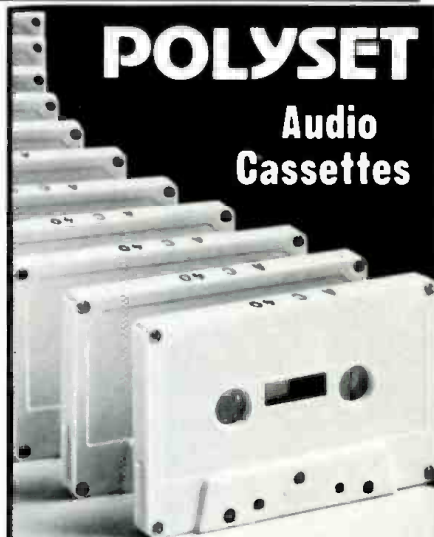
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which created the degradation. The more difficult the problems became, the less effort was expended.

THE ORIGIN PROBLEM

I would now like to demonstrate the problem of comparing degradations when we allow them to come from a vast variety of physical processes. In FIGURE 1, I have created, using an exaggerated scale, several different types of non-linearities. These include the following: a simple second order gentle non-linearity, a saturation effect at a high level, a small periodic variation in gain, a zero crossing non-linearity, a hysteresis non-linearity, and a single bump non-linearity. I would like to ask you how can we compare the equivalence of these types of degradation? Furthermore, can you be sure that each will have a subjective manifestation with a given type of program? The answer is that we cannot compare them, and we will find that the subjective manifestation is unpredictable unless we know the program.

If you do not believe me, then try answering the following question: Based on the harmonic distortion

curves of FIGURE 2, which amplifier is the best one? It is a bit like asking which is worse—a defect in the muffler of a car or a leak in the roof? In a well defined situation we can ask the question. With trained listeners, we can ask them for a particular piece of music, which sounds better. If the results are consistent we can trust them. Notice however, that this may not correlate to any measured value of a particular meter. And we may find that a given amplifier sounds better with one type of music than another. We may never again be in the position to rank order equipment in terms of better and worse—regardless of the published specifications.

MATCHED MEASUREMENTS

For each of the types of non-linear distortion, I can invent a particular measurement method which is maximally sensitive to that type. I could therefore have a set of meters for: simple second order non-linearity, third order saturation, periodic gain variations, etc. Being reasonably smart, I could invent hundreds of meters—each of which was designed to extract a measure of some specific type of degradation. Now my data sheet would have 100 distortion numbers. What would the user do with such a set of numbers? In themselves, they have no meaning other than being technical measures. We assume that the measuring equipment works as described.

To make this discussion less abstract, we should view TIM (transient intermodulation distortion) and its cousins in this light. It does measure something and this measure means that there is a certain amount of a certain type of degradation. However, it tells you nothing about its per-

ceptual manifestations. Will an amplifier with 0.1% TIM sound worse than one with 0.01%? Nobody has demonstrated a direct correlation between perception and measurement. We can accept that TIM is a measure of a particular type of degradation. Being a devil's advocate, I would like to introduce the Blesser distortion measure.

It is defined by the following algorithm:

$$(1) \text{ Blesser} = \frac{\sum (v_o - v_i)^4}{\sum v_i^4}$$

where v_i is the input signal and v_o is the output signal. Presto, we have a distortion measure that is very good at finding a particular type of distortion. Would you like to use my new measure? If so I can sell you some test equipment which will allow you to evaluate your amplifiers in terms of Blesser distortion. If you order a dozen, I'll give you a good price! Now, back to reality. The ability to use a distortion measurement assumes that we already know that it has an important role. If we do not know that it plays such a role, we must first prove it.

PERCEPTION

If you have no food, that is bad. One slice of bread is better than no food, and a small sandwich is better than one slice of bread. Here we have a perceptual response to the amount of food. We do not need to run an experiment because it is obvious. To somebody in the professional audio field, it is also obvious that an amplifier with 10% harmonic distortion will sound very bad and one with 0.01% will sound very good. We know this because we have *BOTH* measured and listened to such devices. It is not

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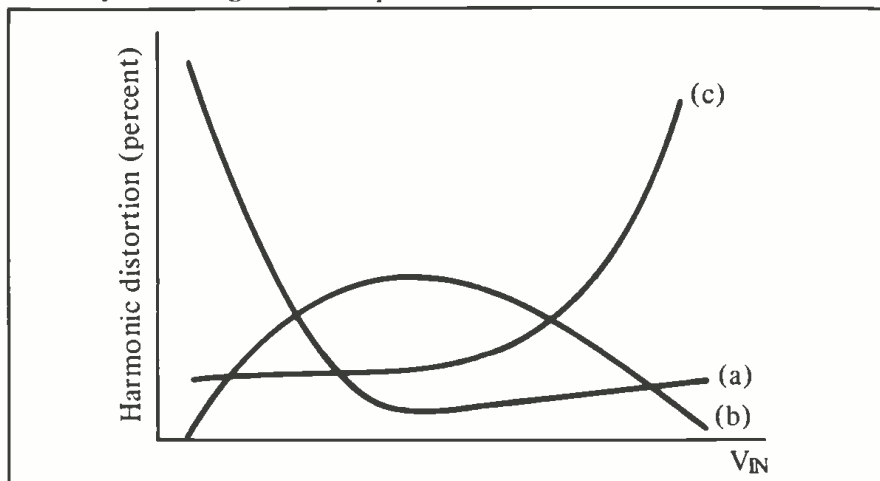


Figure 2. Examples of three different curves of harmonic distortion as a function of input signal level.

obvious that we can rank two amplifiers which have 0.05% and 0.01% harmonic distortion when that distortion is of the same type, such as simple second order. To demonstrate this, we would need to do a very careful experiment. Using the food analogy, it would not be obvious that a forty course meal is better than a twenty course meal. It might be worse because we could become sick.

Those of us who have personally run perception experiments have come to have an intuitive understanding of what they mean. With gross phenomena, the results are reliable and repeatable. A gross experiment might mean the perceptual difference with two amplifiers having 10% and 3% distortion.

A difficult experiment might be one where we were comparing two A/D converters having similar specifications, but where the second from the MSB bit was significantly off. This kind of experiment is extremely difficult to run. The experimenter has to design a training session to teach the listener how to "tune" into the particular issue. Generally, one does that by producing a very gross defect to teach the manifestation. As the training session progresses, the experimenter reduces the magnitude of the effect. Only then can a true experiment be run.

The reason for this difficulty is that the human mind can selectively pay attention to any of hundreds of perceptual phenomena, but only one at a time. Some people are much better at teaching themselves how to perceptually tune in the desired effect. Because of my special training in audio, I can detect certain kinds of digital defects easily, but I would not be a good person to use in an amplifier distortion experiment. Some engineers who work with phono-preamplifiers can hear 0.5 dB frequency response errors at the high end.

CONCLUSION

The problem as I have presented it is basically unsolvable. We can describe one hundreds of degradation measures—each of which play a different role in perception, depending on the listener and the type of music. The industry has no way of collecting this multi-dimensional description into a single rating. Hence, we cannot compare different kinds of degradations unless they are grossly worse than others.

Perfection requires that each

degradation mechanism be below the audible range for all listeners on all types of program material. Although this may be an admirable goal, it can never be achieved. Any belief that a technology has achieved this, will be demonstrated to be an illusion.

Digital audio has been invented because of the well known degradations of certain types of analog equipment; namely, tape recorders and LP records. To this end, digital audio has achieved the goal of reducing the set of gross degradations to a much lower level. It only reduces a particular set of degradation; but in exchange it also introduces another set of new degradations. Never before could we talk about harmonic distortion as 0.002% when recording music.

However, we now add the following new degradations: quantization noise, aliasing error, image frequency generation, clock-jitter, phase distortion of filters, time dispersion, limit cycle oscillations, bit errors, etc. I am not saying that these degradations are large or significant; it only means that we have a new group of measures which have to be evaluated.

Any attempt to rank order equipment thus requires us to compare the non-linearity of a triode with the time dispersion of a brick-wall filter. This cannot be done.

When a large group of degradations have all been reduced to the same magnitude of perception, further improvement is very difficult because *all* the degradations must be reduced. To further complicate the problem, the perceptual scale is non-linearly related to the physical scale. Reducing the noise level from -85 dB to -95 dB is 10 dB but this is not the same perceptual 10 as a reduction from -95 dB to -110 dB.

The intellectual burden of performance evaluation is more difficult than simple electronic engineering with laboratory measuring equipment. Yet, very little effort is placed into the problem of evaluation. That has been the domain of magazines, marketing people and advertising copywriters. They are not up to this very difficult task. The audio industry should pay more attention to the contradiction: If you do not know how good "good" is, how do you know which efforts will make it better? ■



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Sound Reinforcement in Southeast Asia

Engineer Ed Learned is back this month to recount details of his second trip—this time to Southeast Asia as sound system designer and operator for Ronald Shannon Jackson and the Decoding Society. Read on for an account of this new journey and learn even more about sound engineering abroad.

DURING my eight year association as engineer for Eclipse Jazz, a student-run organization that promotes jazz concerts at the University of Michigan, I most enjoyed working with groups featuring eclectic styles and musical influences. One group of this type that was consistently enjoyable was Ronald Shannon Jackson and the Decoding Society. Shannon was one of the driving forces in Ornette Coleman's electric "dance" bands of the late 70's, and further expanded the melodic concept with the Decoding Society: a band which "decodes" music from the morass of the programmed and categorized. Their influences included the full gamut of improvised music, as well as the melodies and rhythms of many cultures, often multi-layered. The range of sound created by this band was always a treat for the inquisitive ear, so I always looked forward to working with them. In the summer of 1983, the Decoding Society was selected to represent the US as musical ambassadors on a fall trip to Southeast Asia, sponsored by the United States Information Agency (USIA). Due to the recommendation of the band's management and my prior international experience, I was tapped as sound designer and engineer for the tour. From September 13 to October 22 we were to give performances in Singapore, Indonesia, Thailand, Malaysia, Hong Kong, Taiwan, and Burma.

PA POWER HANDLING VS. SIZE?

My most immediate concern in planning for the Decoding Society tour was the PA power handling vs. size question. As on my prior USIA-sponsored tour, there was a size and weight restriction on the PA. And, as before, the band was to play a wide variety of venues, from an American school courtyard to a 2500 seat open-air theatre. The Decoding Society played very powerful music, *ELECTRIC* in every sense of the word! When I'd worked for them in the past, a great deal of equipment had been required to properly reproduce the band's sound. Even with the more generous size and weight limitations proposed by the agency, it was obvious that the sound of the group might be compromised. To try and minimize this, I made arrangements for PA augmenta-

tion at all venues larger than 1000 seats. This could either take the form of contracting a local sound firm (if there was one) or using the venue's house PA system (if any). With the cooperation of the group in balancing stage sound, I felt confident that we could handle the smaller venues with the equipment we'd carry with us.

Besides added power, the Decoding Society also required greater mixing facilities. The band for this tour consisted of Ronald Shannon Jackson, drums; Bruce A. Johnson Jr., fretless electric bass; Vernon Reid, electric guitars, guitar synthesizer, and banjo; Henry Scott, trumpet and flugelhorn; and Zane Massey, soprano, alto, and tenor saxes. All instruments were amplified on stage, the horns via clip-on Sony condenser mics, and then run through a plethora of pedals and other outboard signal processing devices. In addition, the horns themselves were mic'd; the different combinations of "dry" and "wet" horn sounds created varied tonal and harmonic textures. These combinations, along with the sounds created by the other electric instruments, gave the Decoding Society the broad sonic palate that it was known for. To reproduce it would require an increase in console inputs, as well as mics, mic stands (especially booms), and cables.

AERIAL ENTERPRISES

To provide the PA equipment, I again turned to Aerial Enterprises, Inc., of Whitmore Lake, Michigan. I'd used an Aerial sound system on my previous USIA-sponsored tour with the Chico Freeman Quintet (see *db*, January/February/1985), and had been extremely pleased with its performance on several levels. Not only had the system provided the smooth, uncolored response and flexible coverage I'd demanded, but its ability to weather abuse was outstanding. This last factor was perhaps the most important, as the abuse delivered during foreign touring is quite severe. Many roads in Asia are below par; baggage handlers and porters exact their toll as well. The best sounding PA in the world is worthless if it doesn't work.

For this tour, I elected to increase the speaker compliment to ten Aerial floor monitors. This allowed me to use six for the house PA, and still retain four for use as stage monitors. I planned to use three per side, placed on their sides and stacked in a column. I also used the cabinets mirror-imaged construction to create added

Ed Learned has been working in professional sound reinforcement for ten years and is now a chief engineer at Aerial Enterprises, Inc.

gain at key frequencies, specifically low end. The bottom two cabinets in the stack were placed woofer-to-woofer, yielding an increase in bass response required for proper presentation of bass drum, tom-toms, and electric bass; I needed all the help I could get. The top monitor was placed woofer up, so as to get more direct sound into balconies (if any), or provide unobstructed main floor coverage (see diagram). I planned on paralleling the three cabinets on each side, creating an input impedance of 2.6 ohms.

By using this speaker configuration, the overall power of the house system could be increased without using any extra amplifiers, thus saving valuable weight. My amplifier compliment, as before, was two Crown DC-300A's in an Aerial double DCA rack, which features transformer-isolated inputs and forced-air cooling. DC-300As will operate into a 2.6 ohm load, but they eat AC and get real warm. The rack's two 4½-in. Pamotor fans, sealed enclosure, and limited exhaust provided efficient forced-air cooling, drawing air over the amplifiers' heatsinks. A.C. current draw for both amps at this impedance would be no greater than 14 amps. With my stepdown transformer output fused at 20 amps, and a 28 amp, 240 volt input capacity, there was plenty of current available. I also split the house PA load between the two amps: Channel 1 of the top and bottom amps each powered one side of the house PA. Channel 2 of each amp powered one monitor mix, with two floor monitors per mix. With neither amp required to handle more than one side of 2.6 ohms, the amps delivered around 400 watts. And there was more headroom when the monitors were run at a lower level, as Channel 1 of the amplifier could then hit the amplifier's power transformer a little harder.

To handle the extra mic assignments, it would be necessary to add more inputs to the CAE XPC-2 mixing console. The console has no mainframe: modules stack and attach sideways to each other, so the board can be any size from one to forty eight inputs. By taking only as many inputs as needed (plus a spare), valuable weight could be saved. To insert modules, an endplate was removed, exposing the chassis guide holes and buss pins. The extra input modules were then added, carefully matching guide posts and buss pins. The corners of the modules were screwed together, and the end plate replaced. This entire operation took only about five minutes, yielding a 16X2 console. I also ran a quick check on the console, checking complete buss continuity and confirming full operation of the new input modules. I've made it a habit to check consoles immediately after working on them; I hate surprises at the gig.

The house electronics, power distribution, and snake package were identical to the previous tour. I increased the mic compliment, using two Crown PZM-31Ss, seven Electro-Voice DS-35s, four AKG D-200Es, and an Electro-Voice 670 that I planned on using for talkback or, in a pinch, as a spare. I also included two Aerial direct boxes, which include both instrument and speaker level inputs. I increased the number of mic stands, packing extra booms and baby booms. Speaker and mic cables also proliferated at an astonishing rate. Fortunately, with judicious packing, all the mics and cables still fit in the same case as before. The final system consisted of 13 pieces, and weighed around 1800 lbs.

GETTING READY

I made arrangements to air freight the sound system from Detroit's Metro airport to Singapore, where our

first performance was scheduled for Friday, September 16. By shipping a full week before, there would be enough lead time to (hopefully) avoid the problems of the last tour, where the gear barely arrived in time. The band's stage equipment, at 11 pieces and 700 lbs., would be shipped via Pan American air freight from New York to Singapore on Tuesday, September 13, aboard the same flight that we were to be on. With the final shipping arrangements out of the way. I then flew to NY to enjoy myself for a night or two before attending a briefing session, involving the band, myself, and the USIA escort officer, on Sunday, September 11.

THE BRIEFING

Mel Rizzie, the agency escort, ran the briefing. Mel, like most escort officers, was a retired foreign service officer who had traveled the pertinent parts of the world extensively. As a group, we broke the proposed schedule down, day by day, discussing potential problems, questions, and answers. We discussed all related performance and production details, such as sound check times and equipment transportation. Mel then gave us an idea of what to expect in each country, with respect to food, customs, climate and culture. All transportation, lodging, and customs details were to be handled by Mel, so we could concentrate on producing the show. After the briefing, Mel, Vernon Reid, myself, and Roger Cramer, one of the band's managers, went to pick up the band's equipment and deliver it to Kennedy airport. Once there, we checked in the gear, and received a nasty surprise: It weighed 940 lbs., well over what had been claimed! Fortunately, Mel had blank air freight bills of lading, so the corrected weight was written in. At that point, we were excused until Tuesday, September 13, when we were to meet at the airport around 8:00 am. I whiled away the time visiting old friends and sampling NY's many jazz clubs and restaurants.

WE'RE ON OUR WAY!

Tuesday, despite being somewhat groggy due to the hour, I managed to fight for a cab and make it to Kennedy by 8:15. I was concerned about being late—until I realized I was the first one there! The next guy I saw was Vern, and he was closely followed by Mel. Everyone else showed up by 9:00, and we were soon all checked in; Mel asked about the band gear, and found that it had been loaded on the plane. We took off at 10:00 to begin our epic flight to Singapore. This flight was scheduled to make two stops, in San Francisco and Hong Kong respectively, before arriving in Singapore around 12:15 am Thursday. Mercifully, I don't remember too much about the flight, except that I did wake up in time to see us flying over and landing in Hong Kong at night—an incredibly beautiful sight. But, after 20 hours of traveling, I was quite glad to get off the plane in Singapore. We were met by officials from the Singapore Jazz Festival, for whom we were to play on two consecutive evenings, and whisked through customs to our hotel.

Mel and I went over to the local USIA office late Thursday morning to discuss the Singapore performances and chase down our equipment. We had one very big problem—no band gear! It wasn't on our flight when we arrived in Singapore, and Pan Am was trying to trace it back: at this point we knew it had been off-loaded in San Francisco due to the weight of baggage added in California. Our PA had arrived earlier in the morning, and was being trucked over to the Dewan Persidangan

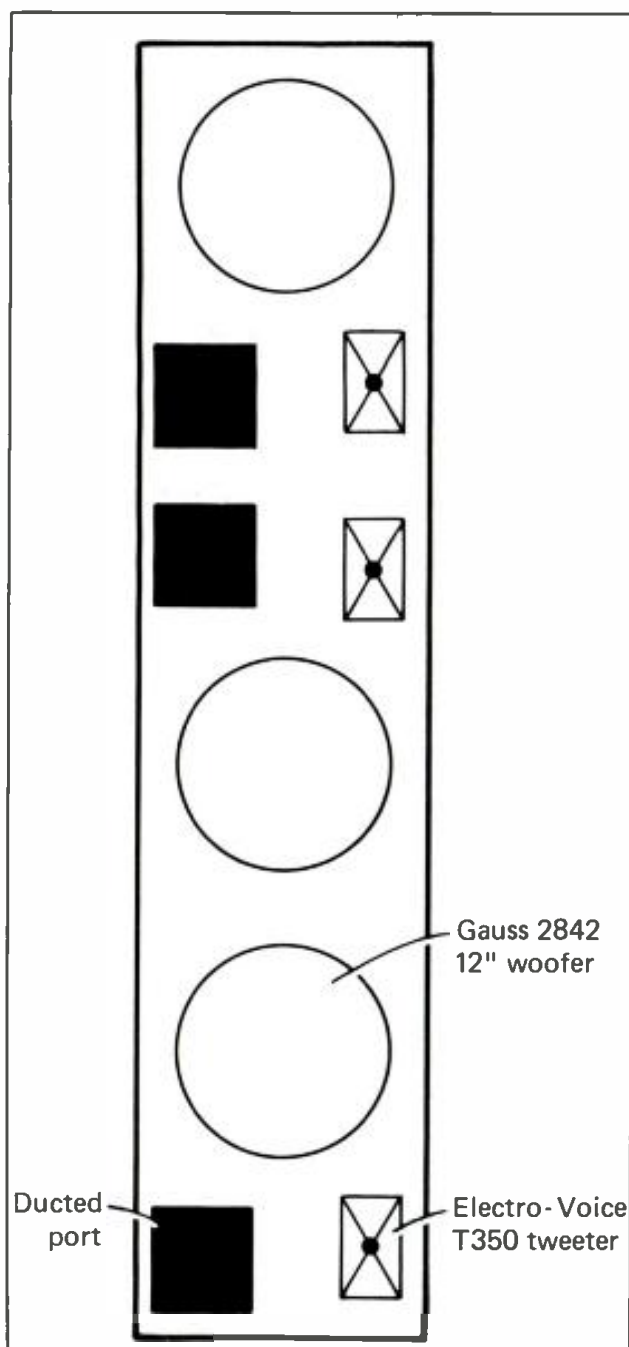


Figure 1. Diagram of one side of PA stack. Note the placement used to increase bass response.

Singapore, the site of the jazz festival. After bringing Shannon up to date on developments via phone, we talked to representatives from the jazz festival about production. The Yamaha Music Company of Singapore was providing all equipment for the festival, including full PA for the venue, so I wouldn't have to use any of our sound gear. I also asked the Yamaha people to provide instrument amplifiers and a drum set with cymbals, in case ours did not show up in time. I then took Mel's advice: when the going gets tough, the tough go shopping. When Mel and I returned to the hotel, there was a message waiting concerning the missing stage equipment. The gear had gone from San Francisco to Honolulu to Tokyo; it was scheduled for shipping to Singapore, via Hong Kong, on Saturday—but it would not arrive in time to be used for the performance. At least we were covered, thanks to the Yamaha people, and the gear would be held at the airport

to facilitate easy customs processing for Sunday's flight to Jakarta, Indonesia. We all slept a little easier Thursday.

Our Friday sound check was scheduled for 1:00 pm, so I caught a cab over to the hall around 11:00 am. Upon arrival, I was introduced to Barry, Yamaha's head technician. We discussed my layout and stage needs before he began sound checks for the Singapore Broadcasting Company (SBC) Orchestra and the Richard Ortega Quintet, both scheduled to appear before the Decoding Society on the evening's program. Staging changes took an inordinately long time, and there were problems such as mismatching of snake assignments and lots of feedback, especially during Richard Ortega's sound check. I observed the chaos, and phoned Mel to tell him that sound check was going to be at least an hour late. I also spent a good deal of time sitting at various points around the hall, checking out PA coverage. The auditorium seated 1024, most in floor seating, with a large rear seating area that resembled a giant concrete bleacher. The hall sounded quite nice, with a manageable reverb time. There was plenty of 220 volt, 50 cycle power in stage pockets, containing 15 amp, new UK-type receptacles with functional equipment grounds, on the sides and rear of the large stage. The house PA system was all Yamaha: one S6115H, one A4115H, and one S5115H per side, powered by Yamaha 2200 and 2100 amps. That's two 15-in. woofers, two midrange horns (one a radial) and a tweeter per side. Stage monitors were Yamaha S2115H monitors (a 15-in. cone and a metal radial horn), powered by 2200 amps with a PM-1000 16 input console and Yamaha graphic equalizers providing processing. The house console was a 32 input PM-2000, with Yamaha 1/3-octave graphic equalizers, crossovers, and DDL. There also was an AKG BX-10 reverb. Mics were AKG, Sennheiser, and Electro-Voice, with some of the better condenser mics provided by the SBC, which was recording the festival via split off the stage mics.

The group showed up at 2:45, and an hour later were set up and mic'd. I raided my PA case (stashed in a back room) to get two PZM's, which I used as drum overhead mics. Once sound check began, the monitors either couldn't be heard or squeaked. I spent a good 15 minutes onstage with the band going over the three mixes we'd asked for, and finally making them work right. I had the impression that the sound crew lacked experience, so I tried to keep things as basic as possible, without a lot of added variables. Once this was accomplished the group played 45 minutes, giving them a good rehearsal and giving me a chance to hear some of the newer material. I was concerned about volume, as we were on a bill with a big band and an acoustic quintet. Using Barry's SPL meter, the sound pressure registered 105 dB peak at the mix point (behind all floor seats, left center), and 115 dB peak on stage directly in front of a stack. Barry informed me this was 10 dB hotter than any other group so far, but still within acceptable limits. The band was finally comfortable with the borrowed equipment and the stage sound, so we returned to the hotel to relax before the show.

AN ASIAN REACTION

We were all a little concerned about the first show, because of the new gear, new surroundings, and new audience. How would Asian audiences react to the music? We caught part of the SBC Orchestra and most of the Richard Ortega sets, which all ran overtime. We tried to assist by setting up fast; I double-checked mic placement and patching to insure accuracy. The guys then settled

into a great 45 minute set. The initial reaction of the audience to the music was shock, but when the groove took hold they got over it fast—applauding loud and long after each number. The group received a standing ovation, and praise from the other musicians present. I got complimented as well: Barry mentioned that he really liked the band sound, and there were no complaints about volume. Saturday's set up was at 3:30 pm, as the Decoding Society was opening the evening's show, and once in place we could stay that way until after our set. That morning, Mel called and asked me to meet with him in Shannon's room. We had a major transportation problem. For the rest of the trip, all equipment was to fly as accompanied excess baggage, to insure that it stayed with us and to facilitate customs processing. Excess baggage tickets had been written for 2600 lbs. of gear. However, as the



TIM Amphitheater in Jakarta Indonesia during setup.

band gear had been underweighed, we had 2740 lbs.—and the baggage tickets could not be changed or reissued. Some equipment would have to be sent home. Shannon explained that he'd cut band gear down to the bare minimum, and couldn't send anything else back. I was already concerned about being underpowered, and the only significant saving I could offer would be in speakers or mic stands. By cutting stage monitors from four to two and cutting out two mic stands, I could save 210 lbs., bringing us within limits again. The group and I worked out a stage layout that allowed Shannon to go without a drum monitor, and the horns to share one instead of two. This decided, we made the necessary arrangements with USIA-Singapore.

Sound check went smoothly, although early on I noticed an intermittent "fuzziness" in the house left stack. Upon closer investigation, I discovered that the driver on the radial was inoperative; the fuzziness I'd heard was the driver trying desperately to work. I pointed this out to the sound crew, who hadn't even noticed. There was no spare, so I unplugged the horn to prevent it from gurgling. I ended the sound check reading 102 dB peak SPL at the mix point, and was quite proud of myself for reducing the volume even further. I shouldn't have bothered—as soon as the band started to play that evening, I had a steady stream of complainers, plus shouts of "turn down" from some members of the audience during Shannon's announcements. Even one of the festival organizers came up to complain—it was a nasty situation. The band played right through the complaints, completed the set, and

were greeted by a wild standing ovation—it seemed most people loved it! The volume situation was interesting, because I'd actually mixed softer. The difference was that tonight we opened the show, whereas the night before we went on last, so people were already acclimated to amplified sound. Dealing with criticism is implicit in being a live sound engineer: you can always count on being second-guessed. A thick skin helps, but one should always be open to constructive criticism. My bruised spirits greatly improved back in the dressing room, where the group thanked me for not emasculating the music, and I got compliments on my mix from some of the other musicians present. I supervised loading out my sound gear from the storage room, and returned to the hotel to pack for Sunday's flight to Jakharta.

I was at the airport early on the 18th to help Mel collect and process the equipment, which at last was together in one place. Our flight took a little over an hour, and the broken cover offered an opportunity to see numerous islands in the Indonesian chain. We were met at the airport by Carl Fritz, a local USIA official.

Once at our hotel, Carl gave us a quick briefing on Indonesia, and we discussed our schedule. The PA augment that I'd requested was arranged for our two Jakarta performances, which were to be held in a large open-air theatre. At a reception for the group that evening, we met many Indonesian cultural, press, and music people who were quite excited about our upcoming performances.

Monday morning, I left the hotel at 9:00 am to set up at the Taman Ismail Marzuki (TIM) Amphitheatre. The extra PA was already in place: four Altec 15-in. woofers in Perkins-type enclosures and two Altec multicell horns with Altec drivers per side, powered with SAE 200 and BGW 750 power amps. I needed all the extra power: the TIM was a covered stage playing to an open-air, tiered concrete seating area, capacity 2500. The power drop was stage right, but there was no single 220 volt line—at this facility, all receptacles were wired with two 110 volt hots to derive 220. As I couldn't tie the two hots together, I elected to go with a single 110 volt line; it turned out to be about 135, and fluctuating wildly. I rewired my transformer input to the 120 volt tap, and ran my own equipment ground to a water pipe stage right. I set up and checked in about two and one half hours, enjoying the perfect weather all the while. The augment and my PA sounded good together: I had plenty of power for the venue. Carl gave me a lift back to the hotel; I returned at 4:30 pm with the band for set up and sound check.

STAGE LAYOUT ROUTINE

Now that we had our own equipment with us, we were able to settle into a routine as far as the stage layout was concerned. This stage plot, illustrating what was done to compensate for the loss of the two monitors, was used for the remainder of the tour.

Ronald Shannon Jackson, composer and bandleader, played Sonor drums and Paiste cymbals. I mic'd the bass drum with a PZM placed directly in front of the drum on the floor. Not only did this yield a great kick sound, but also added "meat" to the toms as well. I was also able to send a mic stand home for weight savings. The snare was close-mic'd with an Electro-Voice DS-35, placed just slightly over the rim of the drum. The Paiste Rude hi-hats used an AKG-200E, which I placed over the top of the cymbals, and pointed down at the top about halfway in from the edge. I've found these cymbals to be very bright,

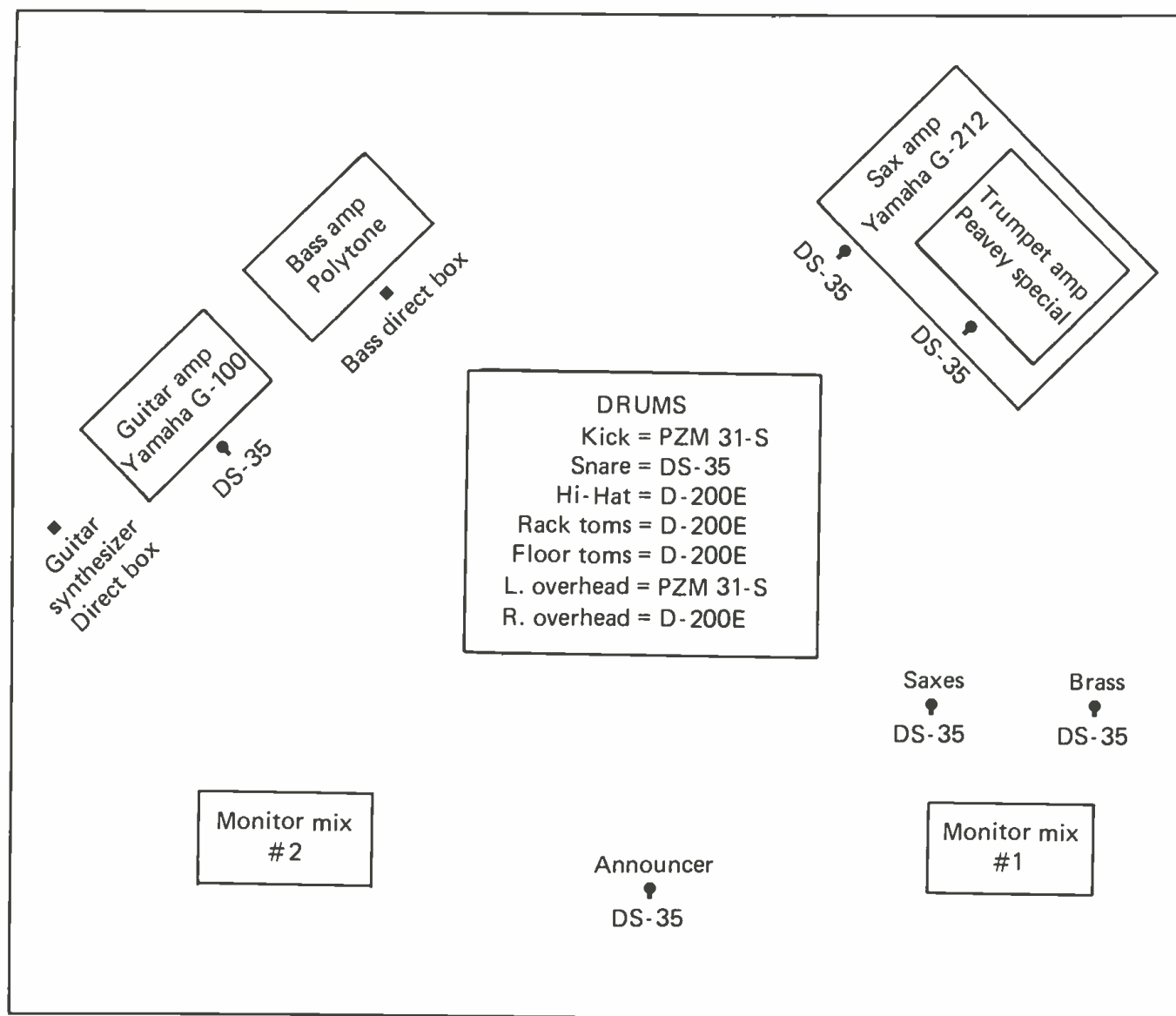


Figure 2. Stage plot used for most of the Decoding Society's Southeast Asia tour.

and this mic'ing helped keep things from getting too edgy. The two rack toms and the floor tom were mic'd with 2 AKG-D200Es, the racks sharing one mic. I tried to keep these at least 4-in. away from the drums, as this provided a more even sound. A PZM mounted on a boom stand was used for the left overhead (ride cymbal side of the kit), and another AKG-200E was used for the right overhead. I didn't need a whole lot of EQ, as the drums themselves sounded great. I'd usually turn up the kick PZM and the overheads to an appropriate level, then add whatever else I needed.

I mic'd the horns with DS-35s: Henry played his trumpet and flugelhorn directly into his mic; Zane used his as a bell mic for alto and tenor, a pad mic for soprano. Zane usually preferred to have a little top end rolled off his alto to smooth it out. Sony clip-on condenser mics were added to the horns for amplification. These were run into effects devices, and then to the respective amplifiers. Zane used an Ibanez multi-effects box, Henry used an MXR digital delay and a wah-wah pedal. The horn amps were stacked, with the Peavey Special (brass) on top of the Yamaha G-212 (saxes). This stack was angled towards Shannon, so he could hear the amp sound. The amps were

mic'd with Electro-Voice DS-35s, placed tight to the grills, with the null points of the mics pointed towards the drums. I mic'd the Peavey's speaker a little off-center, to avoid having the brass amp sound too bright. Both guys shared a monitor, which received mostly "dry" horns with enough of the "wet" sound added so the effects could be heard. On larger stages, I'd add the guitars as well.

Vernon Reid played Gibson Les Paul and Steinberger electric guitars, Roland guitar synthesizer, and 6-string banjo, equipped with a Barcus-Barry transducer. These all ran into a maze of pedals and effects devices, then into a Yamaha G-100 amp. I close-mic'd the amp with an Electro-Voice DS-35, and also took a direct line off the guitar synthesizer for better clarity. The mic was positioned near the center of the speaker for extra brilliance. I would often roll a bit of low end off the mic to get the guitar sounds to blend better. And *WHAT* sounds they were! I could look forward to something amazing from Vern every night. Working with such an inventive musician was a real pleasure, only accentuated by his easy-going attitude.

Bruce Johnson played a Kramer fretless electric bass into a Polytone bass amp. I used a direct box, instrument

level input, on the bass; I'd tried a speaker level input, but couldn't get the clarity I wanted. I had Bruce run the gain on his bass fairly high, so I could get a nice hot signal. This was particularly effective for Bruce's playing style, which featured lots of slides, double-stops, and pops. The bass played an important role in the Decoding Society, providing a shifting pulse of undeniable strength.

As on the other side of the stage, both the guitar and bass amps were angled towards Shannon, enabling him to better hear the guitars and bass. The remaining monitor was placed stage right and shared by Vern and Bruce. This mix contained guitar amp, guitar synthesizer, and a little bass, which enabled Vern and Bruce to hear themselves despite their angled amps. Horns were also added, as they were on the opposite side of the stage. There was never any need for drums in the mixes: At the level Shannon played, hearing the drums was never a problem.

The band used the sound check to rehearse "Satin Doll" and "When The Saints Go Marching In," as they'd been requested to add standards to the program by USIA cultural officials. It was hoped that by adding familiar songs to the band's repertoire, there would be a frame of reference for people who had only been exposed to more traditional forms of jazz. Zane and Vern worked out some clever arrangements of these songs, "decoded" in the style of the band.

The evening's show went very well: we had no equipment or sound problems. The crowd numbered around 900, and quickly warmed to the music. Weather conditions were perfect: 70's, clear sky. The group played one and three quarter hours straight through (we'd agreed to always play a continuous program), and handled the new material with aplomb. Zane played a beautiful solo on "Satin Doll"—Johnny Hodges meets Ben Webster. After the show, I had to completely tear down and lock the gear in a back storeroom, as security was non-existent.

We set up again on Tuesday morning around 10:00 am; everybody remembered what to do so it didn't take long. Monday's concert had received rave reviews in the local press, so that evening our audience expanded to 1600, mostly young people who were very demonstrative: They went nuts at the end of most tunes! Several of them spoke excellent English and dropped by to chat with me before the set. It seemed that the word was out about the band; as one guy put it "we didn't expect this group to be so heavy." They were all musicians in a hotel lounge band, who had come with a friend that attended last night's show. They also told me that Kool and the Gang were scheduled to play in town three days after we left, also at the TIM. I hope they got the same great response we did.

LACK OF SECURITY

After the show, many people swarmed up on stage to get autographs and talk to the band. As there was no security to prevent this, I hurriedly packed my house gear and rushed up to the stage to get my mics—too late. Someone had pinched one of my DS-35s. To say I was angry was an understatement: Vern told me later there was steam coming out of my ears. While I packed, I had a talk about the lack of security with Carl Fritz. He made arrangements to send a cable, requesting added security for stage and dressing rooms, to all the other USIA posts that we were to visit. We established a new policy: The band would be brought to the edge of the stage after the performance to sign autographs and chat, keeping the

stage secure from the audience. To compensate for the lost mic, I decided to eliminate the right overhead, moving that AKG D-200E to the trumpet amp.

Wednesday, September 21, was a free day for the group, but a travel day for me. We were scheduled to perform in Surabaya on Thursday and Friday. Garuda Airlines were concerned about the weight of excess baggage, so it was decided that I would accompany the gear on a flight today. Mel and the band would follow tomorrow, as originally scheduled. Carl picked me up and drove me to the airport, giving a rolling tour of Jakarta as we went. Traveling by car in Jakarta can be very interesting—traffic is usually quite heavy, and people drive like maniacs. The city is probably the car exhaust capital of the world: it hangs in the air like fog, especially in the morning. You see many motorcyclists (a popular means of transportation) with bandanas over their faces like cowboys, trying to beat the fumes. Upon arrival at the airport, I found that the gear had already been delivered and checked in, so I waited in the television-equipped departure area (showing Western rock videos), as the flight was one half hour late. The flight was enjoyable; from my seat I viewed some of Indonesia's rain forest and two volcanoes before landing. I was met by Nick Mele, head of the branch USIA office here. He'd been instrumental in pushing for the Decoding Society to be sent to Southeast Asia, and was determined to see that we enjoyed ourselves. The gear was collected and sent to the office for safekeeping; I was sent to the Hyatt Bumi Hotel, where we were to play our Thursday concert.

Once checked in, hotel officials, Nick, and I went to the Mahkota Ballroom to check it out. There was a portable stage available, in modular 4x4 foot sections. After dictating stage size and placement, I investigated the A.C.; there were wall outlets, containing new UK-type 220 volt five amp receptacles, with functional equipment grounds. I arranged for the house electrician to supply a 15 amp receptacle of this type, and place it next to the stage to supply my transformer. I noticed that the voltage was the most stable I'd seen in Indonesia; the hotel had not only voltage stabilizers but a backup generator. For our performance, the hall would seat about 400, so a lot of sound reinforcement would not be necessary. Nick also arranged for stage lighting to be brought in, as the hotel's track lighting was inadequate for this purpose.

The gear was delivered to the hotel by 1:30 pm Thursday, about the same time the group wandered in from the airport. We had a late afternoon sound check; the room proved to be very live, so careful balancing of the stage sound paid dividends. About 300 people attended the evening's concert, a very mixed crowd in terms of age and status. Nick mentioned that the Jakarta reviews would be in Friday's papers, so he expected a better crowd tomorrow.

Friday's set up was 10:00 am at the Perhimpunan Persahabatan Indonesia-Amerika (PPIA). The PPIA was a library/classroom complex with a center courtyard, where we were to play on a small portable stage. Setup went fast, but dealing with power proved to be a real headache. As at the TIM, power was a pair of 110 volt lines, with a neutral that carried a good 20 volts. There was no equipment ground, and no place to get one. I rewired my transformer input to the 120 volt tap, and ran my ground to a copper pipe that we drove into the earth next to the stage; I grounded the neutral here as well. The voltage fluctuated wildly, with drops of eight volts sometimes. Vern saw my "ground" at sound check, and

remarked that he didn't even want to know what my day was like. The courtyard seated about 450, and, being open-air yet intimate, sounded great. Our evening's performance went great—the place was packed, with standing room tickets being sold. The crowd was almost entirely young people, who loved the music and the band. Henry brought the house down on "Saints" with some unaccompanied electronic trumpet, featuring flanged slurs and wah-wah laughter. After loadout, we returned to the hotel, where Vern, Bruce, Zane and I ate and hung out with some young Indonesian musicians who had attended our show. They played us a cassette of their group, a "fusion" band that combined Indonesian Gamelan instruments with Western instruments to create original jazz, in the style of Weather Report. It was nice to see the music expanded by combination with another culture; both parties gained from our evening together.

Saturday was another travel day, and started early. We were to fly from Surabaya to Jakarta, and then on to Bangkok, Thailand, via Singapore. There would be a five hour layover in Jakarta between flights. Nick, bless his heart, got the gear out on the earliest flight to Jakarta that morning, to avoid having to split the shipment. Carl and the Jakarta team would receive and process the equipment for us; we followed on a later flight. Carl met us, and took us to his house to while away our layover. Customs processing again went smoothly, and we were finally boarded on our flight to Bangkok at 4:30 pm. We arrived that evening in the middle of an absolute downpour—welcome to the rainy season. Larry Daks, the USIA official who met us, told us that the hard rain fell only in spurts; I hope so. The gear was claimed and processed, and we were quickly transported to our hotel to rest and relax.

I was picked up at 10:00 am Sunday, the 25th, to set up at the American University Alumni Language Center (AUALC) Auditorium, seating 800, about 200 in a balcony. There were power receptacles, old UK type 220 volt 15 amp, stage right, but none had functional equipment grounds. I improvised one to a dressing room toilet pipe. During our afternoon sound check, I discovered that one of the 12-in. cones in the house left stack was "rubbing," most noticeably at lower frequencies. I swapped this cabinet with the horn mix stage monitor, as it required the least bass, and made a mental note to try and arrange for a replacement.

Larry had stressed moderation to the band during sound check, as he expected the crowd to be a society crowd. For this type of audience, he felt standards and low volume should be the order of the day. The hall was very live, and seemed to reinforce high end considerably—I rolled some highs out of the PA, and had the band watch their treble on stage. With careful stage balancing, I felt that volume was in hand. The evening turned out to be quite a surprise: The place was sold out, and the crowd was much younger and hipper than we'd expected. I mixed conservatively for two tunes, then decided to go for it, as the size of the audience had improved the hall sound. The audience loved it; the response was overwhelming, culminating in a standing ovation. As an encore, the band played a "decoded" Elvis Presley version of "Love Me Tender." Great stuff! After teardown, I returned to the hotel and called Aerial, requesting that a new 12-in. woofer be priority air-freighted to Bangkok immediately; hopefully, it would arrive in time for our second Bangkok performance on Friday, September 30th, also held at the

AUALC. This required the use of the damaged speaker for our up-country trip, but Zane and Henry informed me that they could live with it. I also requested another DS-35 to replace the one that had been ripped off.

Monday was a free day in Bangkok. I was treated to modern Bangkok's greatest problem: flooding. Some streets contained water as high as four feet, swallowing cars and inundating shops and homes. Incredible traffic jams occurred as vehicles tried to negotiate the waters, or detour around them. As Bangkok grew, many of the old canals the city was famous for were paved over for roads—resulting in less drainage. The land itself is sinking, due to the overuse of artesian water fields under the city. In a few more years, the problem will be critical. So a word to the wise: Always allow extra transportation time in Bangkok during the rainy season. You'll need it.

Tuesday found the group, Larry, and all our gear aboard a large bus, traveling the eight hours to Khon Kaen, located in the northeast of Thailand. The drive offered a chance to see some of the country at close range. The first part of the trip featured lush green forests and tall hills, some spotted with Buddha figures and spirit houses. Further north were rice paddies, stretching as far as the eye could see. During our lunch break in Korat, I again eagerly ate the Thai food, much to the delight of the locals and Larry, who was impressed by my tolerance. We arrived in Khon Kaen around 5:00 pm, and were treated to an evening dinner/reception hosted by the rector of Khon Kaen University, where we were to play tomorrow night.

I was taken to the University for setup on Wednesday morning. The grounds were quite extensive and very pretty. Enrollment was 5,000, but over 10,000 people were housed, including students, faculty, maintenance, and government people. The venue turned out to be a protected stage playing to a concrete-floored pavillion seating area, all covered by a roof, but with open sides. The grass around the pavillion was covered by tents to increase the protected seating area. There was power stage left, with European-type, 220 volt 15 amp, round pin receptacles, and no equipment ground. I ran an equipment ground to a water pipe at the rear of the stage: I tied the neutral here too, as it carried eight volts. Set up went quickly, thanks to abundant student labor. The pavillion seating area had a nasty resonance, which I cleaned up by attenuating the PA slightly at 500 Hz. The school provided a PA augment for the tented seating area, which proved to be four locally-built speakers along the lines of a giant Shure Vocal Master column. Their plastic grills were not removable, so I couldn't see what was inside. There was also a local power amp, purportedly delivering 400 watts. The whole thing sounded ratty even at marginal volume, but as it was the only equipment available I tried to run it as low as possible and still get some usable coverage. Larry then treated me to lunch at a local food stall-restaurant, where I caused quite a sensation: Larry told me they'd never seen anyone as tall as me before!

OUR LARGEST CROWD

That night we played to our biggest audience in Thailand—the rector estimated there were over 3,000 people in attendance, the largest crowd for any musical event in the University's twenty year history. The primarily student crowd loved the band, showing their appreciation loudly and often. Vern was the crowd favorite, and got the crowd to clap along in accompani-

ment to several of his guitar solos. Everyone was justifiably elated, and continued the celebration back at the hotel.

We left Khon Kaen for Korat late Thursday morning. We arrived early in the afternoon, and, after another Thai lunch, I went over to the hall. The venue was an old provincial hall, seating about 500, and had the acoustics of a giant handball court: Reverb time was about three seconds. Power was upstage right—a European-type, 220 volt 15 amp, round pin receptacle with no equipment ground. I fashioned an equipment ground to a water pipe, outside the building in the rear. I also earthed the neutral here, as it was carrying fifteen volts. USIA had never presented any music programming in Korat, so we were an experiment, so to speak. The place was completely full (admission was free), but by the middle of the second number half the audience had walked out! The sound was a disaster—it was a constant struggle to get definition, let alone good tones. Those people who did stay for the whole performance proved to be an excellent audience, as demonstrative as any in Thailand. Afterwards, we quickly packed and returned to the hotel in the pouring rain; it was a frustrating evening for all of us.

We were back in Bangkok on Friday after another bus ride, ready for our second performance in the familiar AUALC auditorium. During my set up, Larry arrived with a package; my parts had arrived from the States! Even the embassy people were impressed—the package had arrived on Wednesday evening, in record time from Detroit. I replaced the rubbing 12-in., and got the new DS-35 into the rotation. Once again, we had a sellout crowd, this time with standing room. It was a younger crowd, primed for the Decoding Society. And the band was ready to cut loose after last night's debacle. It was a magical combination, and our most successful concert of the tour. As an encore, the band played a "decoded" version of a song composed by the King of Thailand, "Hungry Man Blues," much to the delight of the audience. This song had been played to close the set on our trip up-country, and was always a hit. After teardown, we returned to the hotel through the usual downpour and did some serious celebrating. Saturday was a day off before our scheduled TV taping Sunday.

Bruce and I arose early on Saturday to take a personal guided tour of Bangkok, visiting several of the more famous Wats (Buddhist temples). The rain held off all morning, so we enjoyed the incredible sights: One Wat featured a five ton solid gold Buddha figure! Later, Mel, Larry and I went over to Bangkok's Channel 7 to check out facilities for Sunday's taping. As their audio facilities were not extensive, we agreed that I should provide an audio feed for the taping, using my mics and mixing equipment. Power was a US-type Edison receptacle, but supplied 220 volt 15 amps with no equipment ground. The station electrician agreed to procure a ground, so having taken care of the arrangements, we returned to the hotel to enjoy a dinner/reception in our honor.

I was over at the station early on Sunday to prepare for the taping. I set my mixer in an adjacent studio to try and get some isolation, and mixed using headphones. We ran through a couple of takes, and after each Shannon and I would run up to the control room to check sound and camera angles. Once satisfied, we cut about six tunes, including "Hungry Man Blues," which Shannon dedicated to the King. Our performance was scheduled to be broadcast on the King's birthday, so he'd be able to enjoy this "decoded" arrangement of his song. After-



The Decoding Society on stage in Bangkok for TV taping.

wards, we were treated to a Thai feast at the home of Larry and his wife, then returned to the hotel to prepare for tomorrow's journey.

OFF TO MALAYSIA

Monday, October 3rd, was our travel day to Malaysia. With Larry's help, we breezed through customs, and enjoyed a leisurely flight to Penang, one of the resort spots of Malaysia. We were met by Cathy Gunning of USIA-Kuala Lumpur, who'd flown up to meet us with performance permits. Customs here proved to be difficult, as special permission was required when entering the country for performance purposes. Even with the help of Cathy and Sharifah, the USIA cultural attache, it took a while to sort out the red tape. Our gear was collected and processed, but I found we were missing two speaker cabinets. The airline people started a tracer on it, and agreed to leave word at the hotel when the gear was located. We adjourned to the hotel, where the band held a press conference, and afterwards were taken to the local jazz club for a reception and jam session. Zane sat in on tenor with the house band and tore up, bringing the evening to a rousing climax.

Early Tuesday, Cathy and I went over to the Dewan Sri Pinang to set up. The hall seated 1,300, in sloped theatre-type seating. The room was quite large, with a very high ceiling, yet it sounded quite nice—except that it just ate all the low end. There was a house PA, set high in the proscenium arch, but it didn't have any real bass response, so I was going to have to improvise. Power was available on both sides of the stage, with old UK-type 220 volt 15 amp receptacles, containing good equipment grounds. When I returned to the hotel, I received a message: The speakers had been located in Singapore—and would be flown in and delivered to the hall by truck, in time for our afternoon sound check. Vern and I took advantage of some free hours to dally on the beach, which was incredibly beautiful and inviting.

As promised, the gear was delivered to the hall and, after hooking it in, we sound checked; I had Bruce run his bass amp more bottom-heavy to try and get extra bass into the room. We had only about half a house for the evening show, which went smoothly except for Vern's guitar synthesizer, which made a horrible crackling every time he played it—he finally stopped using it. We checked his rig after the show, and the "problem" turned

out to be a frayed cord—isn't it always the case? The gear was being trucked for the rest of the inter-Malaysian jumps, as our flights were in smaller prop planes that couldn't handle the weight of our equipment.

Wednesday's flight to Ipoh, aboard a prop job, gave us a good opportunity to see the countryside due to the low flight altitude. The land was a verdant green, criss-crossed with the patterns of irrigation canals for rice paddies and palm oil plantations. After crossing a tree-covered mountain range, the land became blotched with colored ponds and brown, barren areas. This was tin mining country—and Ipoh was the center of the mining area. Upon arrival, I was taken directly to the hall for set up; the gear was already there when I arrived. The Wisma Chin Woo was a rectangular room, seating about 900, with a tile floor and plaster walls—very live



Ronald Shannon Jackson on drums at the AUALC Auditorium in Bangkok.

acoustically. The power was in pockets downstage center: new UK-type 220 volt 15 amp receptacles, with functional equipment grounds. The Ipoh Y.M.C.A., our local sponsor, provided plenty of labor, so I had an easy time. At sound check, careful balancing of the stage sound helped maintain good sonic definition. The performance was almost sold out, and the crowd definitely helped the room sound smooth out, although in the back things sounded mushy due to the long reverb time. After the set, the band was presented gifts by the sponsors; when I was called up for mine the crowd gave me a standing ovation, the only time I can ever remember *THAT* happening!

Thursday found us traveling to Kuala Lumpur, where we were to play the first ever Malaysian Jazz Festival, sponsored by the Country Inn Jazz Club, Malaysia's oldest operating jazz club, in conjunction with the Malaysian Ministry of Culture. I met with festival officials at the Country Inn that afternoon, and got all related planning out of the way. Bose of Malaysia was to provide full sound reinforcement, featuring a Bose 800 speaker system for mains and monitors. For our group, I elected to also use our cabinets, as I'd never been fond of the Bose low end. I planned to use my console so I could retain my soundcheck main and monitor settings, needing only to repatch into the snake during set change. This was the first Jazz Festival presented by the Country Inn, and there were bound to be the usual first time errors. I wanted to make my set up as fail-safe as possible, my set change as fast as possible.

I'd decided to get an early start Friday, so at 9:00 am Cathy and I were at the civic auditorium, in a large multipurpose room that was usually the site of badminton tournaments. It was long and rectangular, with wood floors and concrete walls. The stage was placed at the long end of the room, which helped create a disastrous three and one half second reverb time. In about 50% of the seats, echo was so bad that direct sound was overwhelmed by mush. There was power on the wall behind the stage: plenty of new UK-type 220 volt 13 amp receptacles, with functional equipment grounds. Checking the system confirmed my worst fears; it would be very difficult to maintain clarity in the hall. I pointed this out to the organizers, who added more seats to the front sections. The Bose people finally showed up, and added their PA; eight Bose 800s per side in groups of two, elevated with tripod support systems, and powered by Bose amplifiers. The "console" was three small boards wired together.

This caused an immediate headache, as signal routing was screwed up and there was a nasty ground loop. Out came the soldering irons, and after a few hours things started to sort out. There were continued problems with stage setups, monitors, and mic patching assignments all afternoon. It wasn't until 5:00 pm that we sound checked—I had the band's stage volume the softest it had ever been, and mixed extremely conservatively, anything to keep the volume as low as I could. The show started late, and kept getting later, but the audience didn't seem to mind that much; the crowd of around 2,500 was vibrant, and always appreciative of the music. We got through the set change with everything working, and the band played a strong 90 minute set. Room reverb was still troublesome, but the size of the crowd helped just enough to pull it off. About halfway through the set, which had been a smash so far, much of the crowd got up and left! We found out why after the show: the busses in K.L. stop running at 1:00 am, and, due to the hour, there wasn't much time left. I had lots of help for the loadout, and after a brief stop at the hotel Zane, Bruce, Vern, and I went to the Country Inn, where the music went on until 4:00 am. Many of the festival musicians participated in a floating jam session, with the loudest applause reserved for the three "decoders" whenever they played.

I enjoyed the 8th and 9th as days off, although I did attend the band's Saturday workshop out of curiosity. Shannon talked a bit about the music and answered a few general questions, then everyone split off into individual instrument groups: Zane with the saxophonists, Shannon the drummers, etc. I was spotted and cornered by several of the aspiring sound and tech people; I ended up answering questions for about two hours. Several were already working as club soundmen or were employed by a group. From the interest and facility I observed at the workshop among the musicians and tech people, modern Malaysian music will be a force to be reckoned with. My evenings were spent at the Country Inn with assorted band members, enjoying the ongoing jam sessions and the friendliness of the Malaysian people.

OFF TO HONG KONG

On Monday we traveled to Hong Kong. We enjoyed a beautiful view of Hong Kong from the air, and experienced a Hong Kong landing, which is not recommended for the easily frightened. We were the guests of the Hong Kong Arts Center, where our concert was scheduled for tomorrow night. A representative of

the center met us and started collecting the gear. I was told that customs inspection and processing would take twenty four hours, and the gear would then be delivered to the theatre for afternoon set up.

Tuesday was perhaps our smoothest day. The stage crew at the Arts Centre was excellent, and the Shouson Theater had all modern conveniences. Power was available stage left, new UK-type 220 volt 15 amp receptacles on a power board, with functional equipment grounds. The hall itself was quite small, seating only 450 on a steep slant. It was wider than deep; the back wall was only 45 feet from the stage. I positioned my house stacks to cover straight away, and positioned my top speaker, woofer down this time, angled towards the center of the hall around 45 degrees. When the band sound checked, it became obvious that the mix for the evening would be comprised primarily of stage sound. Most of our time was spent balancing the stage level to appropriate levels—I added the slightest hint of drums, and boosted solos slightly. We'd been told that Hong Kong audiences were tough to please, but the sellout crowd responded immediately to the music. Shannon played exceptionally, including a three-part drum solo featuring mallets, brushes, and sticks. The group received a standing ovation, and after the encore many stayed to talk with the band. It seems many music fans here had been aware of the band for some time; tickets had quickly sold out. Their excitement and enjoyment made it a great evening for all of us. Loadout went even more smoothly than the in, and I was quickly back at the hotel to continue our celebration.

A TOUGH TIME WITH CUSTOMS

Wednesday, October 12th, was departure day. Things were *NOT* smooth at the airport: Our gear was all there, but customs inspection was hell. For the first time on the trip, I had to open every case! In addition, each piece of luggage was individually x-rayed, so it was a long time before we boarded our flight for Taipei, Taiwan. We arrived in the pouring rain and were taken immediately to our hotel while the gear was processed and taken to the American Cultural Center. At a reception for us that evening, we received momentous news: Our trip was being cut short. A group of South Korean dignitaries visiting Rangoon, Burma, had been hit by a terrorist bombing. Some were killed, and many were seriously injured. Communist and North Korean elements were being linked to the attack. The Decoding Society, as representatives of the US, might also become a target due to the friendship between South Korea and the US. As our concerts in Rangoon were to be held in an open-air amphitheater, Burmese cultural officials feared for our safety, and recommended cancellation. Thursday, our free day, was now spent sorting out the new improvised travel arrangements, although I did go to the Palace Museum with Vern and Shannon. This museum contains the most complete collection of Chinese art and artifacts in the world, and is an experience to behold.

I was over at the Taipei City Hall early on Friday ready to set up, but received a nasty surprise: The hall was booked for the day. It wouldn't be available until 5:00 pm, two hours before our scheduled performance, so we were going to have to work fast. I was able to run my snake, uncrate all my speakers, and check out AC. There was a power drop stage right, with 110 volt 60 cycle power. I fashioned tails so I could tie a fused Edison AC strip to the drop—this would function as my power distribution for

Taiwan. The auditorium seated 1,800, with 600 of these in a single balcony, and the acoustics were excellent. I returned at 5:00 to set up, and also supervised the placement of my augment, supplied by a local sound company. Their stacks were 15-in. cones in folded horns, 12-in. in a horn-loaded cabinet, and radial horns with JBL compression drivers. The band sound checked at 6:45 while the crowd was held out. I was pleased with the overall sound of the combined PAs, but I couldn't get the horns to sound smooth, just edgy and harsh. As the augment consisted entirely of horn components, I decided to put the rhythm section only through the augment, and the horns only through my Aerial cabinets, as they were front loaded. This solved the problem, while still maintaining good coverage. We had about 1,200 attend the show, and the Taiwanese definitely dug the music. At loudout, the gear was loaded onto a truck, as all inter-Taiwan travel would be by road.

Saturday, we were off to Taichung, where we performed at the Nantou Cultural Center. This hall seated 900 in severely sloped theater seating. The power drop was located stage right, 110 volt 20 amp outlets with functional equipment grounds. Carpeting and acoustical tile made for nice acoustics. USIA rarely programmed here, yet the place was sold out. In the middle of the performance, Vern's guitar amp began acting up, crackling and buzzing. He tried to get it under control, but couldn't. At the end of the song, Shannon got on the announce mic and asked me what to do. I told him to play a drum solo while we investigated. The amp was definitely malfunctioning, so I moved the guitar mic to the bass and removed the D.I., instructing Vern to play direct and use the monitor system as an amplifier. To totally change setup in the middle of a concert is everyone's nightmare, especially for Vern, who was dependent on his amp for effects like sustain and controlled feedback. However, he handled the situation calmly, like a total professional, flashing hand signals until he had what he needed. He told me later that he'd been incredibly nervous, but when he stood in front of the PA and heard how cool it sounded he loosened up. Despite these problems, the show was a great success.

Sunday, after a short drive, we arrived in Kaohsiung, where we played that evening at the Kaohsiung Chung Cheng Cultural Center. The hall was very beautiful and quite large, seating 2,000—900 in a single balcony. Power was available stage right or left. Both 110 and 220 volt 60 cycle AC were available, on 15 and 20 amp receptacles with functional equipment grounds. There was a house sound system, on the facing above the stage, and after dumping a bit of 500 Hz I was able to blend it effectively with mine. We had another sellout crowd for our last show of the tour, and the band played with a lot of heat, determined to go out with a bang. I never really was happy with the bass level in the house, but other than that I ended on a positive note as well.

COMING HOME

Monday, October 17th was a travel day, as we drove back up the island to Taipei, where we spent the evening before going our separate ways on Tuesday. The group flew from Taipei to Tokyo to LA, where the band was scheduled to begin a US West coast tour in late October. Mel and I went Taipei-Tokyo-Chicago, where I continued on to Detroit, Mel to Washington, D.C. Then it took me a good three days to figure out what time zone I was in!

Sound in the Holy Land

The following is a detailed account of collected data on Israeli studios and the recording industry on the whole in Israel.

THE RECORDING INDUSTRY in Israel is a thriving business these days and the following is a complete rundown on what's happening right now in Israeli studios. After traveling to Tel Aviv from my home in the north of Israel (Rosh Ha Nikrah), I managed to collect some information on studios in the area. Researching this subject was of great interest to me since a good deal of my free time is spent in satisfying the populace of my kibbutz (agricultural community) and Western Galilee in sound reinforcement productions.

One major problem in Israel is the fact that things are quite expensive. Imported electronics definitely fall into this category. The import duty runs between 100 and 200 percent. One problem with this is that the government sees no difference between a pair of speakers for a home stereo and studio monitor speakers. Thus, all of the hardware and software for recording studios are extremely expensive in Israel. Many manufacturers of pro sound equipment have local Israeli representatives. These include: Studer; Soundcraft; Harrison; Audio Kinetics; Yamaha; Valley People; JBL; MXR; dbx; Shure; Electro-Voice; Sennheiser; Ampex; AKG; and Klark-Teknik. Even with such a large representation there are some studio owners who still find it worth their while to travel to the manufacturer and buy directly from them.

You might be wondering how expensive it is to record in Israel these days. Well, the average price right now in a 24-track studio is \$40 per hour (US currency).

Most of the staffs in the studios are Israelis who have been to Europe and the States to learn the ropes and have

come back to work here. Lately some British engineers have also been coming over to work in Israel.

The work being done in Israeli studios is generally done by local artists for the Israeli public along with a little exporting being done to Jewish communities in the US and Europe. In addition, within the last few years video has become quite popular. As a result, many of the studios are equipped to meet this growing demand.

KOLINOR STUDIOS

Kolinor did the live remote of the Simon and Garfunkel concert with two Studer A80 VU MkIII's for the TV simulcast hoping for quality and a chance for similar effects (visual and sound) for the movie "S&G Live In Central Park." They accomplished this by using Studer equipment during a live performance and SMPTE time code for post sync and editing for video. The signal was taken directly from the stage, then split, and sent directly to a Harrison Console for mix to the two Studer 24-track tape machines. The recording was done by overlapping simultaneous recordings. All post-production work was completed in the States. For the major undertaking, Emil Bar of Kolinor took most of his equipment to a remote site for the recording.

Another major production of Kolinor's was a Christmas special with Perry Como. Como recorded with his choir along with an Israeli artist, Ilanit. The session went so well that it was done in one take. The engineer and crew said that Como was both a pleasant person to get along with as well as a great artist.

Kolinor Studios was the first in Israel, founded in 1964 by Emil Bar and Amnon Roberman. It's still the largest in studio space. They have six full time employees.

STUDIO A

This is the oldest and the largest of the three studios. It has 200 square meters of floor space and seats 65

Ronald Altman works in sound reinforcement on a kibbutz in Rosh Ha Nikrah and has collected a great amount of information on Israeli studios in his free time.



Amnon Roberman at custom designed console in Studio B at Kolinor Studios.

musicians for classical recording. The control room is also quite large with 54 square meters of floor space.

STUDIO B

The smallest of the studios has 33 square meters of studio space and 30 square meters in the control room. The control room is set up for video post productions and overdubs. The console is equipped with a dual monitor system which allows the engineer to make two separate set-ups for recording and playback. The console is also equipped with a custom expander and compressor system which is incorporated into the automation system and video synchronization (post production).

STUDIO C

Studio C is the newest of the three, just completed within the last year. It is an acoustically designed LEDE™ by Bar for desired effects. The studio was built with the recording of both pop and rock music in mind. The control room is 40 square meters and the studio is 42 square meters.

There are various goings on at Kolinor which includes classical music to rock to the audio dubbing of the Israeli version of Sesame Street. Of course, you have the usual radio and TV jingles plus many Israeli artists.

FUTURE PLANS

Emil is waiting for the industry to decide on the acceptable standard for digital recording. Until then, the signal to noise ratio of over 80 db is sufficient with the Studer equipment at 30 ips using high density tapes. He is also planning for a video/audio van for on-location music and events productions. The van is in the late phases of design.

TRITON STUDIOS

Triton Studios, now in existence for ten years, initially started out as an 8-track storefront studio, founded by Tommy Friedman. Over the past ten years expansion has occurred in 8-track stages until we find it in its present stage as a 24-track studio.

Physically, the studio complex consists of approximately 500 square meters containing two studios (A and B), one cutting room, an editing room, a repair room, a technical lab, and personal amenities (kitchen, eating facilities, wash room, shower).

The two studios have an average work rate of 150 to 200 hours a week. This includes radio jingles, TV jingles, movie musical tracks, rock, jazz, pop, new wave, classical albums and singles (specializing in Israeli content). From acoustical layout of the studio, the artists have the possibility of heavy live to heavy dry sound. The studio runs parallel to American standards with floating floors and multi-layered walls with a center insulation of sand.

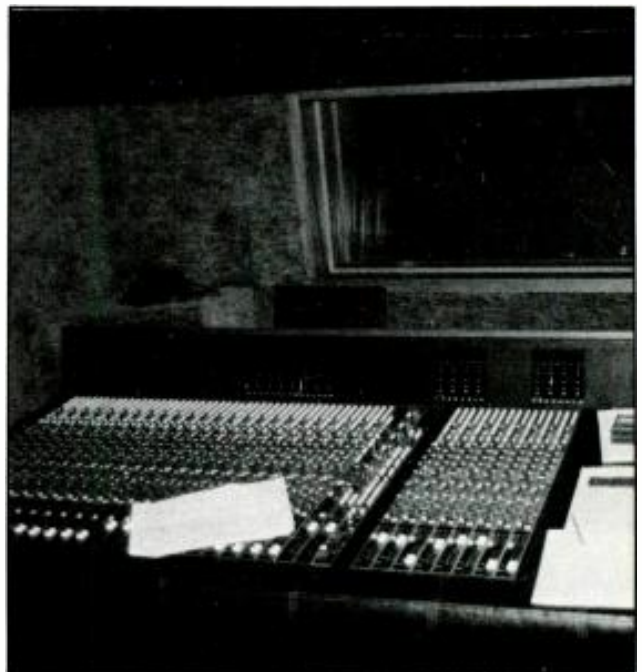
The artist also has the option of using the studio equipment for making a live remote recording, through mobile services supplied by the studio.

Future plans of the studio include ongoing expansion and modernization. Tommy Friedman is presently in Taiwan working on a new 24-track mixing console (using his vast knowledge and experience in the sound industry). The console should be operational by the time this article is published. The studio also plans to purchase video synchronization equipment and a new 24-track tape machine.

PERSONNEL

Tommy Friedman is the founder and designer of Triton Studios. He is presently in Taiwan working on the practical application of a certain number of his inventions. These include certain audio facilities for recording studios and automobile stereo systems. These inventions have been patented and mass produced for the international market. His plans are to return to Triton when his present business commitments in Taiwan are concluded.

Guy Jaffe, present manager of Triton Studios, studied at the Institute of Audio Research in NY. Having received



Harrison MR-2 console at Kolinor Studio C.

his BA in sound engineering, he spent five years in the US at Nola's Penthouse Recording Studios in NY. He has now been in Israel for two years.

TRITON STUDIO A

This is the larger of the two studios having 200 square meters of floor space in the studio and 40 square meters in



Triton Studios manager Guy Jaffe at the customized Neve console in Studio B.

the control room. The studio can easily contain 50 musicians with their various instruments.

TRITON STUDIO B

Studio B is the smaller of the two studios. The studio is 75 sq. meters and the control room is 25 sq. meters. The console is a custom modified Neve Console. It has an on board 16 band shelving equalizer and four echo sends. Another interesting factor on the board is that there are two cue sends and two stereo cue sends.

RULI RECORDING STUDIOS

The Ruli Studios were designed and built by Gilad Keren in conjunction with Amos Shooahat. Ruli was originally founded by an Israeli folklore group, Ambassador, its principle aim being commercial. At this time, the studio will have been in operation for approximately two years.

Ruli's technical design and layout was planned by two Israelis who are now the principal recording engineers. Work was initially started in June of '82 with an investment of approximately \$350,000 (inclusive of equipment). The studio is situated in the basement of a four story building, with offices located on the first floor. Due to the relatively small size of the studio, the acoustic treatment has been limited to a dry sounding environment, both in the studio and in the control room. The environment consists basically of a plaster ceiling and buffered walls with acoustical absorbing material. The control room houses a 24-track system and a LinnDrum machine. Gilad Keren did his early work at Triton Studios. There he received practical working experience with Tommy Friedman. Gilad is an electronical technician who learned the basics of electronics as an Army technician in the Israeli Defense Forces. His present activities include the producing of an Israeli rock group. The studio operates twenty hours a day, seven days a week, and due to its popularity, it is heavily booked. The work staff consists of one manager, three recording engineers, three assistant engineers, one maintenance engineer and one secretary. At the present time, due to the heavy work load, the studio mainly does LP work. Future plans are to expand the very confined control room. At present, Ruli is the most popular Israeli rock studio, producing ten LPs in its first year of existence (all of the cutting was carried out in London). Their success is greatly due to the human factor, when compared to less successful studios with more extensive equipment.

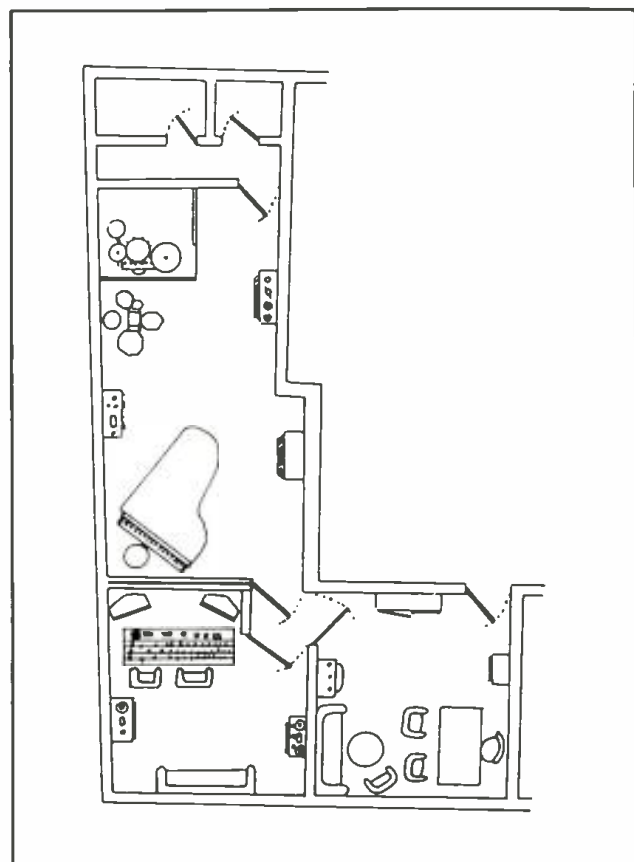
HAROLD STUDIOS

Menachem Olesh and Haim Dor founded Harold Studios in April, 1983. They both have worked in studios in Israel and overseas including, for example, RCC Studios and Park 8 in England, BJ in Orlando, Dumian and Aquarium Studios in Paris. Having both practical experience and financial backing, they figured it would be best to invest in a 24-track facility.

Menachem started off as a musician, beginning with the piano, advancing to the drums, moving from behind the mic to behind the mixing console and then to behind his present desk in the office of Harold's Studios. He studied at the Technical Institute of Sound in London, and worked at various studios in the London area. Within the last two years he returned to Israel.

Haim Dor is always behind the mixing console. Starting off at the bottom in one of the Israeli studios, he decided to learn the profession seriously and travelled to the US. In the States he attended a seminar at Full Sail Recording Workshop in Orlando. On his return trip to Israel he stopped over in Paris and worked there for a short time at the Dumian Studios. In Israel, after his stint overseas, he started working in his 8-track home studio making demos. At that time, Haim began working on plans for the present studio. He then got together with Menachem and founded Harold Studios.

Until now, Harold has only worked with Israeli artists. The management hopes with all the advantages they have to offer, such as highly professional facilities, a lovely Mediterranean atmosphere, and relatively low prices,



Floor plan of Harold Recording Studios.

they will be able to attract big name artists. You will find their studio open 24 hours a day and average a work load of 20 hours daily. Due to such a heavy work load, Harold has one full-time recording engineer, Eytan Levine, who has worked at Kolinor. Besides Eytan, both Menachem and Haim will put in daily time to make sure all is well with the equipment. The physical size of Harold is small by international standards. The control booth is a mere 25 sq. meters and the studio space is approximately 55 sq. meters. Along with miscellaneous areas (office, wash rooms, tech lab), the area totals 115 sq. meters. The studio is in the basement of a four story building and is built on a solid concrete base with rock wool and plaster plating being used for acoustical isolation. One of the more pleasant particulars of Harold's is Yomit Gafny. She acts as financial secretary and handles all promotion. Once you come to Harold's it will cost you \$45 an hour which is all inclusive, save for recording tape. If you plan a lot of session time you can get an eleven for ten deal. That is, you pay \$450 for eleven hours of studio time. The work being done there includes your usual jingles, TV ads, rock, pop, new wave and folk. On the list of outboard equipment you will note the name COBE. It's probably most unknown to the work market. COBE equipment is both designed and built by an Israeli named Dror Harel (see db Studios). At Harold's they are especially happy with the COBE equipment as Dror will custom build to their exact requirements. Harold's is also generally happy with the Soundcraft system. It is good for the needs of the studio, and the local Soundcraft representative offers excellent service backup.

Some of the things Harold's sees in its future are video post-production facilities. Then they will install a digital mixdown complex, and finally, as there is more room for expansion next door, they hope to add more studio space.

GAL KOL

Three years ago Shmuel Abovav took over the first floor of an apartment building and turned it into a full 24-track recording studio. Shmuel is not only an engineer sound wise, but also acoustically and technically. He literally built the studio with his own two hands including the wiring, carpentry, layout and finish. One of his hobbies is computer programming and he now does his own book-keeping via a computer program he wrote himself. Shmuel is an electrical engineer by profession, having studied and worked in the trade. He also worked for six years as sound engineer with the Army radio station. Upon completing his work with army radio he took some to travel around Europe and the US to get an idea of what's happening in the recording industry. Upon returning to Israel, he began to work on Gal Kol. Gal Kol was originally established as a 16-track studio and now Shmuel has invested in a totally new 24-track Trident system.

Taking care of the business side of the studio is Shmuel's wife. Gal Kol, like most of the Israeli recording studios, operates a full day with average booking being approximately twenty hours a day. The studio records rock, pop, folklore, jingles for both TV and radio, and music recordings for TV. It has no dubbing facilities.

Shmuel now has plans of expansion for the future. The aspects of the studio that Shmuel is most proud of and that also set Gal Kol aside from the rest of the Israeli Studios, are his Emulator and Drumulator computers. Besides office work, his Digital Rainbow Computer is also used in conjunction with the Emulator and Drumulator.



Gatley console at Sigma Studios. Note the 'log cabin' atmosphere in the studio.

A SPECIAL PROFILE

Graeme Jackson is a very pioneering engineer in Israel. The first thing that comes to mind (and he will remind you if it doesn't) is that he is the only engineer in Israel who has an "Ampex Golden Reel Award." Graeme received this coveted award while still in England for work on "Video Killed the Radio Star" by the Buggles. You might ask yourself, "What is such a top rate recording engineer doing in Israel?" I asked Graeme the same question, as within four years he advanced from trainee tape operator to senior engineer. He explains that he did not see much room for advancement in the English studios. The second reason Graeme mentions is that while on holiday in Israel he was made so many good offers he decided it would be worth his while. You have to remember that by staying in Israel to work he took a good cut in salary, but Graeme figured it would be a challenge and maybe he could put Israel in its rightful place among the recording nations of the World.

Graeme sees in Gal Kol a studio looking to the future today with the full computerization through the Trident board, digital computer, and Drumulator and Emulator computer systems. Graeme also enjoys a very close working relationship with Shmuel so that the work is conducted between friends, and is not necessarily the usual boss/engineer relationship. In the one and a half years that Graeme has been in Israel, he has been very productive and even more successful. At Gal Kol he engineered and co-produced four number one hits, one of which entered the ranks of Israeli classics.

Graeme feels that not enough people appreciate the vast scope of the Israeli music business. He hopes that within the near future he will see more artists coming to Israel, not just to perform, but also to take advantage of both modern recording studios and cheap studio time. Graeme is the first non-Israeli engineer to live and work full time in Israel.

SIGMA STUDIOS

Meir and Yehuda own Sigma Studios. Meir does the administrative work and Yehuda works more on the professional side, being both a recording and a technical engineer. Sigma started out as an 8-track studio seven years ago, and they have grown to be a full fledged 16-track studio. Yehuda studied at the Institute of Audio

degrees Celsius (520 degrees Fahrenheit). Under this extreme condition, the voice coil resistance will have doubled.

FIGURE 1 shows the cumulative effect of sweeping a 380 mm (15 in) woofer with 200 watts input. Each frequency sweep was spaced by 20 minutes, and the total of eleven sweeps took 100 minutes. What we see is the effect of cumulative heating of the voice coil-magnet assembly and the final stabilizing of the resistance rise as thermal equilibrium was reached. The total observed compression here is some four dB; but if we compared, say, a ten-watt sweep with a woofer at room temperature with this, we might easily see another 1.5 dB on top of this.

The observed reduction in output comes from two things: the first is the reduction in transducer efficiency, and the second is the impedance mismatch with the amplifier.

About the only good thing that we can say about this state of affairs is that it represents the woofer's internal attempt to avoid destruction.

In addition to taking much of the "punch" out of the music, dynamic compression produces another effect which we should note. FIGURE 2 shows a simulated change in loudspeaker low-frequency alignment in a ported enclosure as a function of temperature rise. In addition to the reduction in mid-band sensitivity, there is a clear shift in frequency balance. The system tends to exhibit a peak at the transducer's resonance frequency. While this may look subtle in the graph, it is anything but that. Critical engineers and producers will easily hear this imbalance and be disturbed by it.

HOW TO MINIMIZE DYNAMIC COMPRESSION

The culprit is inadequate heat sinking from the transducer's voice coil, and the obvious solution is to use

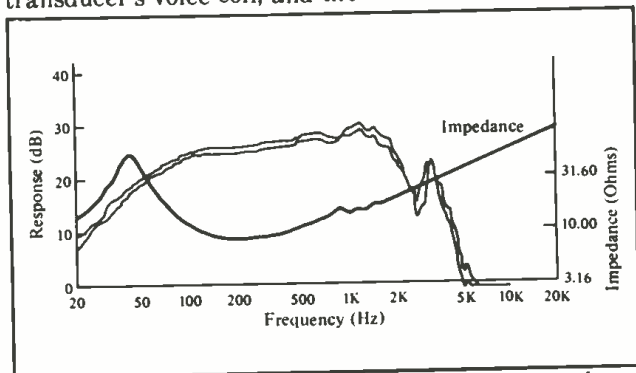


Figure 3. 1 watt and 100 watt dynamic compression of 15-in. (380mm) transducer with 4-in. (100mm) voice coil. Bottom line is 70 dB SPL for 1 watt and 90 dB SPL for 100 watts.

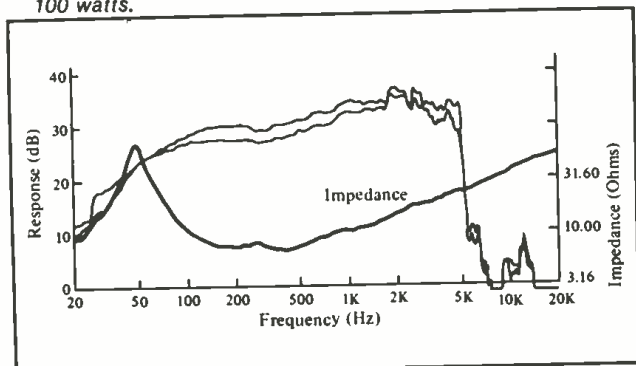


Figure 4. 1 watt and 100 watt dynamic compression of 15-in. (380mm) transducer with a 2.5-in. (63mm) voice coil. Bottom line is 70dB SPL for 1 watt and 90 dB SPL for 100 watts.

larger diameter voice coils. The larger the voice coil diameter (assuming that axial length remains constant) the lower the resistance per unit length of the voice coil for a given DC resistance of the coil. Lower resistance means lower temperature rise. And of course the larger voice coil will have more area for more effective heat sinking. Ferrofluids have been successfully used in the high fidelity industry to protect small tweeters from burn-out. Such materials are not applicable in high-power professional work because the temperature rises which are common in professional applications would result in deterioration of the ferrofluid.

FIGURE 3 shows the amount of dynamic compression observed with a 100 mm (4 in) voice coil with 1-watt and 100-watt sweeps. FIGURE 4 shows a similar transducer with a 67 mm (2.5 in) voice coil. Both transducers are 380 mm (15 in) in diameter. The difference in dynamic compression is obvious and is a clear demonstration of the benefit of a larger voice coil.

CONCLUSIONS

The phenomenon of dynamic compression is unavoidable. At the present time, the most economical design approach which minimizes it is a large voice coil. If you want to be sure about just what the voice coil diameter of a woofer is, don't believe what you see when you casually look at the dust dome. Most manufacturers of smaller voice coil products will use a larger dust dome to conceal that fact. Look underneath the cone at the point where the cone is cemented to the inner suspension. That is where the voice coil former is, and that will give you an accurate idea of the real diameter.

NOTE: Graphs shown in Figures 1, 3 and 4 are measured at 1 meter. Transducers mounted in 280 liter enclosure with large flat baffle.



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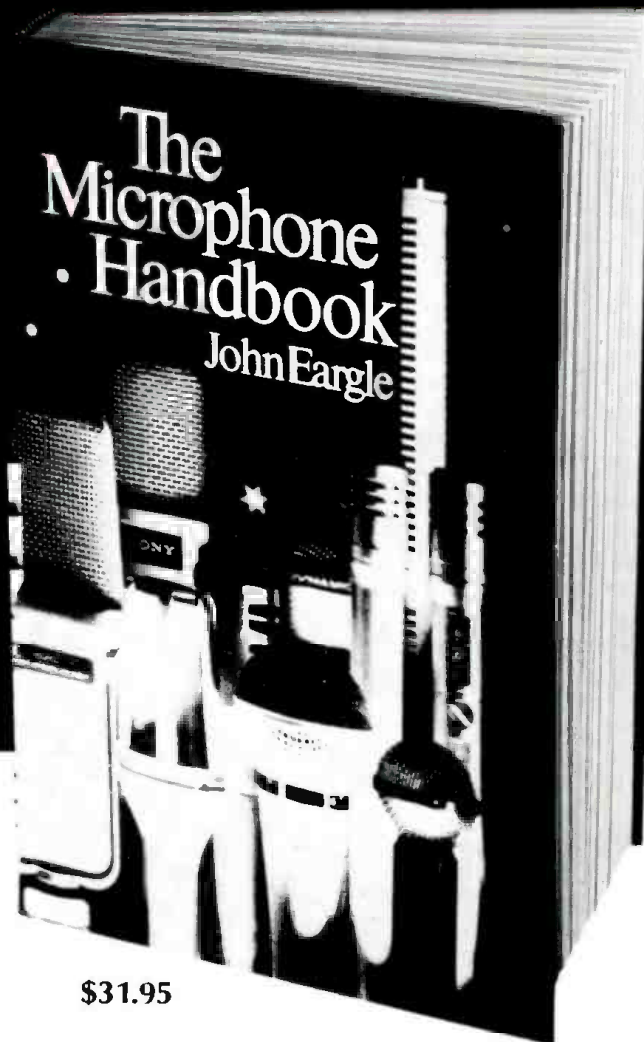
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JOHN EARGLE,

noted author, lecturer and audio expert, is vice-president, market planning for James B. Lansing Sound. He has also served as chief engineer with Mercury Records, and is a member of SMPTE, IEEE and AES, for which he served as president in 1974-75. Listed in *Engineers of Distinction*, he has over 30 published articles and record reviews to his credit, and is the author of another important book, *Sound Recording*.



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Long View Farm Recording Studio

Come along and find out a little bit about a state-of-the-art recording studio set in the sleepy town of North Brookfield, Massachusetts.

DRIVING THROUGH the rolling hills of North Brookfield on a warm, tranquil afternoon, the view is striking—an expansive green carpet that seems to unfold forever. Occasionally, thick foliage filters the bright sunshine splashing off the car; the sky is a perfect azure. The air smells clean and sweet, as if it had been freshly washed of the stale odors of the city. The signs all say Stoddard Road. But the engulfing serenity says you're on the road to paradise.

It wasn't that way a few years ago. JULY. THE SUMMER OF 1981. Long View Farm, a 145-acre countryside recording complex 25 minutes west of Worcester, is under siege. Stoddard Road is awash with people. The sleepy town of North Brookfield, Massachusetts, has been rudely awakened by an invasion of sightseers, groupies, photographers and journalists from every

ELECTRONIC PARADISE

Long View is a state-of-the-art, rock n'roll Club Med where musicians can ply their trade on enough sophisticated electronic hardware to film the next chapter in the "Star Wars" saga. But it still remains quaint enough to bask in the soothing, alternatively plush and pristine surroundings that include a jacuzzi, whirlpool, sauna, game room, several lounges, recreational areas, horseback riding, more than 40 telephones, 25 television sets, more stereos than you'd find in a Sears warehouse and, should the fancy strike, even a few cows to milk and a few chickens to feed. There's also the much sought-after privacy that can never be captured in the glass-and-steel valleys of most big cities.

Markle bought the farm in the summer of 1973 by borrowing a substantial sum of money (which he will quote only as being in the "low six-figure range") from a few Provincetown friends. At the time—and he is to this day—Markle was the founder and president of American Leadership Study Groups (ALSG), one of the largest overseas high school student tour groups in the world, and only intended the farm to be a picturesque retreat, a place to dabble in sophisticated recording equipment, which he has always loved.

GETTING NOTICED

But all that changed radically before Jagger & Co. checked in. By 1974, Long View Farm was a fully equipped recording studio. By 1976, Long View was on the map, hosting a lavish, well-publicized press party to announce the release of a new Stevie Wonder double album, "Songs In The Key Of Life." Due to the media blitz that Wonder whipped up, there was no turning back. Markle knew that if he was going to attract other big names in music, he would have to offer them the most technically-advanced environment possible, along with the relaxing grassroots solitude (and a bit of expensive pampering), that music meccas like New York and Los Angeles could never match.

"Turning the farm into a recording studio was always in the back of my mind," Markle explains from the ALSG offices at Worcester Airport. "And I guess it came to the front of my mind through some friends in Provincetown."

Over the past decade, the amount of money that's gone into Long View Farm is considerable. Part of the farmhouse (which contains six bedrooms and will sleep twenty comfortably) has been transformed into the elaborate Studio A, with a large 24' by 15' by 9' control room possessing 24-track recording capabilities and sync off-line video editing. A spacious, sprawling barn has been magically turned into Studio B and Studio C.



The Long View Farm Studio complex. Studio A is in the house on the left and Studios B and C are in the farmhouse on the right.

publication imaginable. Security guards patrol the fenced boundaries of the property.

Inside the complex, oblivious to the helter-skelter atmosphere outside, Mick Jagger and the rest of the Rolling Stones are rehearsing for their upcoming national tour. Their host is Gil Markle, formerly a professor of philosophy at Clark University and now the mogul behind a cluster of businesses, including the recording complex, which Markle snuggled within the plush, rustic confines of a sprawling New England farm.

Sources close to Markle say the total gross of all his enterprises exceeded \$20 million for the 1983 fiscal year.

Steve White is a Boston based freelance writer focusing on film, entertainment and business.

The former contains 16-track recording, a Baldwin baby grand, and equally sophisticated electronics. Studio C is even larger, carved out of the barn's huge loft. It's a lavish soundstage in itself, built exclusively for the Rolling Stones, and measures over 175 feet in length, with a cathedral ceiling, catwalks and camera dollies. It'll hold an audience of up to 350 people. There's also every conceivable musical instrument on hand and every imaginable electronic recording device to satisfy even the most discriminating artist.

Markle has made this amazing electronic metamorphosis without sacrificing the charm that is one of Long View Farm's major selling points. It's not unusual to see an elaborate and futuristic-looking control board, with enough dials, switches and lights to make the jump into hyperspace, resting on a beautifully burnished mahogany table with a vase of freshly cut flowers. Scattered throughout the farm there are also wood-burning stoves, revolving ceiling fans, countless hanging plants and bird cages, wood everywhere you turn, stuffed animal heads and a country-sized kitchen with pots and pans dangling from the walls and from overhead. And there's a staff of ten to cook the food and keep the complex spotless and running smoothly.

DAILY EXPENSES: \$1,000

Although Markle will not be pinned down as to exactly how much it costs to create this impressive music emporium, he does mention that it takes well over \$350,000 a year to keep the operation running smoothly. "The cost of buying and renting the equipment, plus the technical and support staff, runs about \$1,000 a day," says Markle. And where does the money come from? "Most of the money comes in from the rental of the studios," he explains.

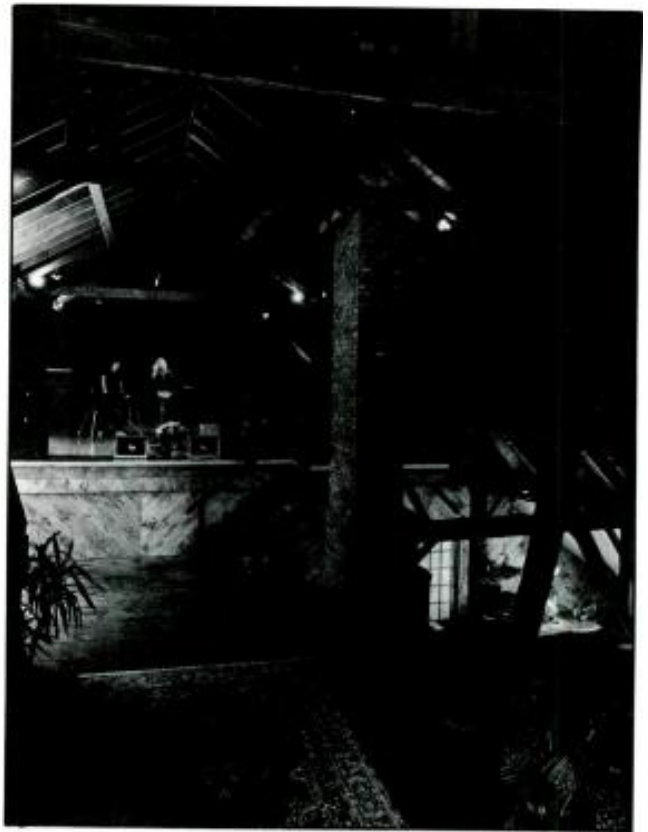
Let's say you've got a band and you want to cut an album among the horses, cows and chickens at Long View Farm. (The J. Geils Band, Aerosmith, Dan Fogelberg and Arlo Guthrie have all recorded there.) If you'd like, you can rent Studio A for \$160 an hour (certified check or cash, please). Included are one in-house engineer, plus food and drink. On second thought, maybe Studio B, a mere \$100 an hour with the same amenities, would be better. Should you decide to stay over a couple of days, it should be noted that one-day price, including three meals and the run of the place, can cost around \$2,000 for a group with up to eight members.

The prices at Long View Farm are not etched in granite, though, and Randall Barbera, spokesman for Markle, says that there is something to fit every budget. Markle has been known to lower his rates considerably to give little-known and under-budgeted local bands a place to record. Some have even recorded on Long View Farm's own record label.

THE MARKLE EMPIRE

Always the entrepreneur, Markle, 44, presides over a sprawling array of independent companies, some of which he uses to expand the services offered by Long View Farm, his pride and joy.

The name of the company that operates Long View's recording studios has seldom been seen in print. It's called: This Is Something Else Inc. Something Else, through Long View, can provide you with a package like this: ten hours of studio time and 1,000 singles for \$2,000. If you want them to push your record for six weeks, be prepared to pay another \$1,800. Then there's



Long View's Studio C sound stage built specifically for the Rolling Stones.

S.E. Music, Inc., which is involved in publishing and record manufacturing, and is the name of the record label used by Long View.

But the linkage doesn't end there. There's also Chart-Air Inc., which will put either a twin-engine Cessna 402 (complete with telephone and fully-stocked bar) or a Piper Navajo at your beck and call. And Myles Travel Inc., one of the largest travel agencies in Central Massachusetts, according to Markle, is available so you can figure out just where you want to go. Another company that's tied in (and the only one that Markle doesn't own) is Symmetry Management, which belongs to Randall Barbera and his brother Tom, who work out of New York. Markle uses Symmetry as a consulting service.

It's possible, therefore, for S.E. Music to write you a song, for Long View to put you in a studio and produce a record; for Symmetry Management to chart its distribution; for ChartAir to pick up that studio musician you need and fly him or her to Worcester and for Myles Travel to figure out, if necessary, how to first get that musician to a place a plane can land. Of course, Myles and ChartAir also serve non-music customers. Only American Leadership Study Groups, Inc. seems to be autonomous of the music operation—unless somebody in a band has a kid who wants a tour of Europe. This year, says Markle, ALSG is setting up tours for more than 10,000 students.

The rise of Gilbert Scott Markle is almost as amazing as Long View Farm itself. Born to Gilbert Markle, an NBC sound engineer, and Connie Gates, a singer with the Tommy Dorsey Band, Markle always had an infatuation with recording equipment and became quite adept at playing several instruments while growing up in the affluent N.J. suburb of Tenafly, New Jersey. He attended college at Rensselaer Polytechnic Institute, and even-

tually his academic career led him to Clark University, where he taught philosophy from 1967 to 1974. He's been married one time (and divorced) and has two children by Nancy Wilcox, a free-lance photographer. He has a home on Cape Cod and vacations frequently on the island of Tobago in the Caribbean. He's gracious and affable. Although it's been said his tastes are expensive, his clothes are strictly downhome—mostly running shoes and jeans.

Both Long View Farm and Markle refuse to sit still as technology unfolds rapidly. Equipment is constantly being updated, as new concepts are always being developed.

EXPANDING INTO VIDEOS

One of the areas in which Long View Farm is expanding is in the field of videos—an absolute must in a visually



Owner Gil Markle at the MCI 528 console in the large control room of Studio A.

oriented world where teenagers (the majority of record buyers) seem to be driven with a desire to "see the music." In its brochure, the studio attracts videophiles by offering "video recording sets and props, including colorful recreational areas, assorted barnyard animals, children and large Disney-like vistas." This past year, ALSG created "Easy Come, Easy Go," a travel video showcasing young Americans studying abroad. The 30-minute film was beamed into 42 markets and reached nearly 20 million Americans in March, according to company literature. All post-production work and the background score was completed at Long View Farm. Markle produced the film.

What propels musicians to leave the big cities, where studio back-up artists are so easily accessible? (Even Markle admits that availability can sometime be a problem.) What makes heavy-metal groups like Motley Crue and Aerosmith trek out to the wilderness to play their hellfire, hard-pumping, knock-down-the-walls brand of rock-n-roll?

"It's a chance to get out of the city, away from the media and the limelight," says Steve Morse, rock critic for the BOSTON GLOBE. "I know the (Boston based) J. Geils Band enjoys it because it's state-of-the-art in their own backyard. The Rolling Stones wouldn't go back there, but that's only because they don't rehearse in the same place twice. But they had no complaints."

So why isn't there a very long line forming to book this apparent rock-n-roll utopia? "It's a mellow, peaceful

place, but not everybody likes that," Morse notes. "Some groups need the excitement of the big city to feed off of and get them going."

Markle, however, believes that the picturesque rural setting of Long View Farm is the perfect soothing elixir for those in the harried, unpredictable world of rock music. "They come because the equipment is state-of-the-art, it's relaxing, has aesthetically pleasing surroundings and there's no parking tickets, no getting mugged and no having to send out for food." ■

SOME OF LONG VIEW'S EXTENSIVE AUDIO AND VIDEO EQUIPMENT INCLUDES:

MCI-528, Soundworkshop 3432 Automated, Aengus 1608: Otari MTR 90 II, Sony PCM, MCI JH114, 3M-M79, Studer A80-VU Studer A80-RCs and A80-VU ½", Scully 280S, Stellavox, Revox, Iawa, Nakamichi, Uher and Tascam tape recorders; Bryston, Crown, BGW, McIntosh and HH power amps; UREI 813A and 813B, Altec 604, JBL 100, 4311, 4411, 4320, Yamaha NS10M, Electro Voice Sentry 100A and Auratone monitors; acoustic live chamber, EMT, AKG 8X10 and 8X20 reverbs; Tektronix, Teletronix, ADR, Lexicon, Roger Mayer, API, Ashley, Aphex, MAP, Pultec, Orban Parasound, Eventide, Publison DMH85, DeltaLab, Loft, EXR, Dolby and DBX outboard gear; Neumann, AKG, Sony, Sennheiser, Electro Voice, Shure, Beyer, RCA, Schoeps and Crown PZM mics; Fender Rhodes, Baldwin, Steinway, Elka, ARP, Prophet V, Ovation and Roland keyboards and synthesizers. Sony BVU-800s, JVC CR 6600U, 8250U, Adda, Crosspoint Latch, Leader, Dynair, Thomson-CSF Broadcast, Grass Valley, Audiotronics, Gerrold, Blonder-Tongue, ESM, Avcom, Ikegami 350s, JVC KY1900CH, BTX Shadow, BTX Cypher, Sony Beta, JVC VHS, Sony, Pro-Feel, Videotek, Sony Projection, House sync and SMPTE code. Complete audio, video and RF tie lines. Cable-grade satellite earth station on premises.

LONG VIEW FARM'S CLIENT LIST INCLUDES:

The Rolling Stones, The J. Geils Band, Stevie Wonder, John Belushi, Pat Metheny, Tim Curry, Dan Fogelberg, Tom Chapin, Don McLean, Larry Coryell, Clifford T. Ward, Arlo Guthrie, Pete Seeger, Cat Stevens, Oregon, Motley Crue, Gary Wright, Head East, Jay Ferguson, Paul Winter Consort, Johnny Winter, Aerosmith, Stuff, Rupert Holmes, Lynsey DePaul, John Butcher Axis, Gary Burton, Melanie, Max Roach, David Darling, David Sandborn, Steve Gadd, Arthur Baker, Chris Kimsey, Justin deVilleneuve, The David Reid Band, Gallagher & Lyle, Cherry Vanilla, Liberty DeVito, Van McCoy, Chuck Levall, Ian McLagan, Karla DeVito, John Fannon, Ric Ocasek, Peter Erskine, Walter Becker, Michael Kamen, Bill Graham, Bob Tischler, Herb Lovelle, Face to Face, Zonkaraz, James Coburn.

Scoring One For the Gipper

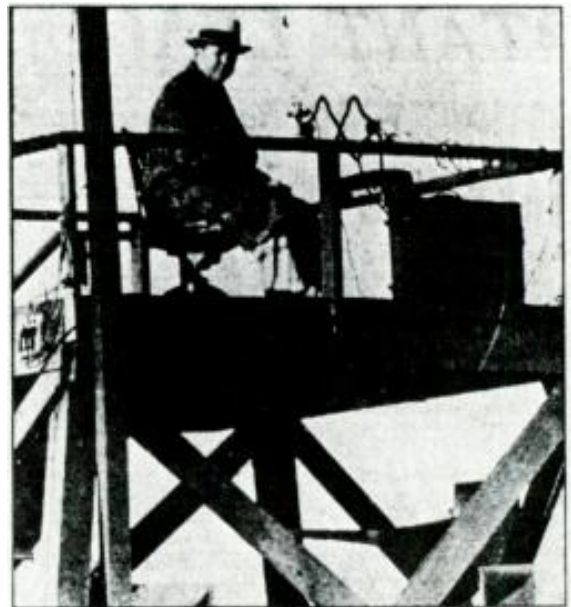
By providing microphones for the Kansas City Presidential Debate of 1984, E-V called on a tradition of service that stretches back to the very origins of public address systems.

DURING THE EARLY MONTHS of 1930, Knute Rockne, the legendary football coach at the University of Notre Dame, was recovering from an illness which made it difficult for him to supervise activities on the University's four practice fields. Electro-Voice, a manufacturer of professional audio products, located in Buchanan, MI, solved the problem. When PA was in its infancy, EV founders Al Kahn and Lou Burroughs built a tower overlooking all four fields and designed a four-speaker system with a microphone and switching mechanism by which Rockne could bark training orders to each of the squads below. As Rockne headed for the practice fields, he would call for his "electric voice" and is credited with inspiring the Electro-Voice name.

Years later in 1979, only ten days before the U.S. Open Tennis Tournament was to debut at Flushing Meadows, NY, Electro-Voice again saved the day. Organizers had forgotten to provide a sound system for the 100,000 fans that were expected. Others refused help, but EV was glad to "serve." So in 1984 when an emergency request came from CBS, the network in charge of the "pool" for the Kansas City presidential debate, EV responded from a tradition of service and helped send quality audio to more than 90 million viewers.

Kansas City, MO—When CBS and the White House Communications Agency fired up their equipment in preparation for the Kansas City presidential debate, they both came up with a "very loud, absolutely objectionable" buzz according to Fred Schutz, Director of Maintenance at CBS. After an hour or two of careful evaluation, the source of the problem was located. A large dimmer board

'Rock' Barks at Practice.



GENERAL ROCKNE COACHING HIS TEAM.

When Notre Dame football teams get ready for games like the Navy tilt to-day, Rockne gets them ready. And he does it like an army officer whipping into shape a company of recruits. Here the Irish mentor is seen in action, directing his team on the field below through a loud-speaking system.

Taken from a 1930 local newspaper, this picture of Knute Rockne at his "electric voice" which inspired the name of Electro-Voice.

under the stage in the Music Hall of the Kansas City Municipal Auditorium was inducing a "very heavy" electromagnetic field into the microphones.

"We tried a number of microphones that we carry onboard our mobile production unit," said Schutz. "and the only ones on hand that would give us enough noise rejection were two Electro-Voice RE18's. Now we had a new problem. It was late Friday and we needed eighteen of these mics set up and tested by Saturday evening in order to meet a Sunday morning rehearsal deadline with the two presidential candidates."

Enter Electro-Voice. Schutz called Hy Badler, CBS Vice-President of Operations in Washington, D.C. Badler steered him to Jim Hargreaves, CBS Manager of Audio Systems in D.C., who reached Greg Silsby, Marketing Manager for Professional Products at EV. Could EV hand-deliver eighteen RE18's to Schutz at the CBS pool trailer in Kansas City? "Of course," Silsby replied.

An emergency request was nothing new to Silsby. Nor was he surprised to hear of the RE18's remarkable performance. Like a number of Electro-Voice Variable-D® microphones preferred by professionals in the broadcast industry, the RE18 employs a "hum-buck" coil to eliminate problems in hostile environments. This coil is wired in series with a voice coil, but 180° out-of-phase. Energy in a magnetic field is induced equally onto both coils and cancelled out due to their out-of-phase wiring.

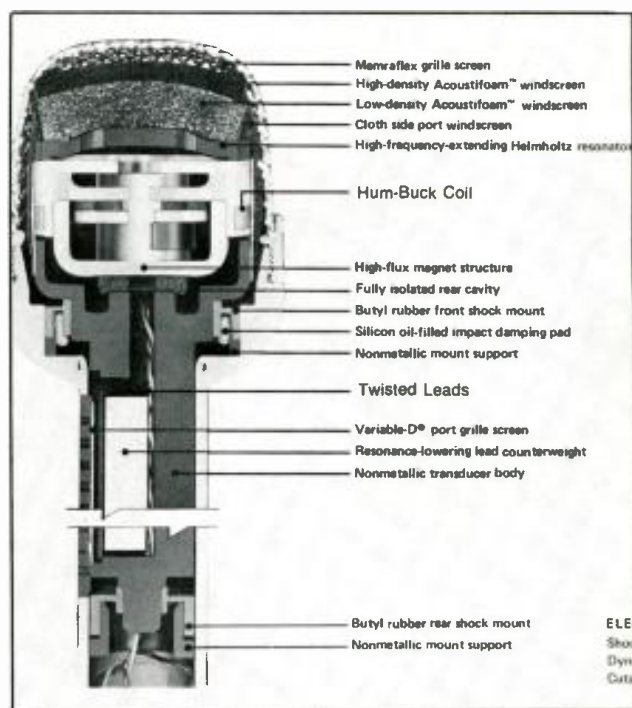
Silsby was confident that the RE18's would solve the problem described in Kansas City, but locating eighteen new mics and getting them there was another matter. He knew it would be difficult to reach either manufacturing personnel or pro sound dealers on a Saturday. So while others began checking repair stock at EV headquarters in Buchanan, MI, Silsby pursued several possibilities. Unable to reach a dealer in close proximity to Kansas City, Silsby contacted the Marriott Hotels there, knowing that Marriotts purchase quantities of RE18's as new facilities open. Bill Larrimer, sound man at the Marriott in Overland Park, KS, had six if they were needed.

Meanwhile, Dave Merrey, Vice-President of Operations at Electro-Voice was investigating getting the product out of EV's manufacturing plant in Newport, TN. Though RE18's are manufactured in Sevierville, TN, they are stock-piled in Newport and shipped from that location. Merrey caught Roger Gaines, Electro-Voice Director of Manufacturing, on his way to a University of Tennessee football game. Gaines drove 45 minutes to Newport to check the stock.

Confident that Gaines would be able to supply the mics, Silsby booked airline tickets from South Bend, IN, to Kansas City through Knoxville, TN, with sufficient layover to connect with Gaines and the RE18's. When Gaines arrived in Newport, however, he found the cupboard bare. Noting that Sevierville was scheduled to have just built RE18's that week, Gaines headed for the plant there. First, however, he contacted Dennis Ehricke, EV Manager in Visalia, CA, to ask that he go to the EV warehouse there, check his inventory and send eighteen mics if possible.

Arriving in Sevierville, Gaines found the mics had been built as scheduled. He packed up eighteen of them, confirmed with Silsby that he would hand-deliver them and headed for the Knoxville airport to catch a flight for Kansas City. Silsby cancelled his reservations.

When Gaines arrived at the Kansas City airport, he claimed the back-up units which Ehricke had located and



An x-ray view of the workings of the RE18 microphone.

sent as baggage on a non-stop flight from California. Gaines rented a car and headed for the debate site. Needless to say, Gaines got a welcome reception from the CBS crew.

"People from the White House Communications Agency were very concerned with the use of a microphone other than the models supplied on the official podium used for all presidential proceedings," said Schutz. "In this case, we had two podiums, each with three mics, and matching microphones for the questionnaires' panel, the narrator and the introduction by the League of Women Voters in an elaborate setup with multiple layers of audio redundancy. The bottom line is, we also had a buzz. And we would have been severely criticized for putting that signal quality on the air."

"Since redundancy is second nature to those of us in the broadcast industry, we too had been scouring the country for RE18's. We had some en route from CBS in Washington, D.C. and New York City. But when Roger Gaines appeared with an armload of RE18's, we were very pleased to see him."

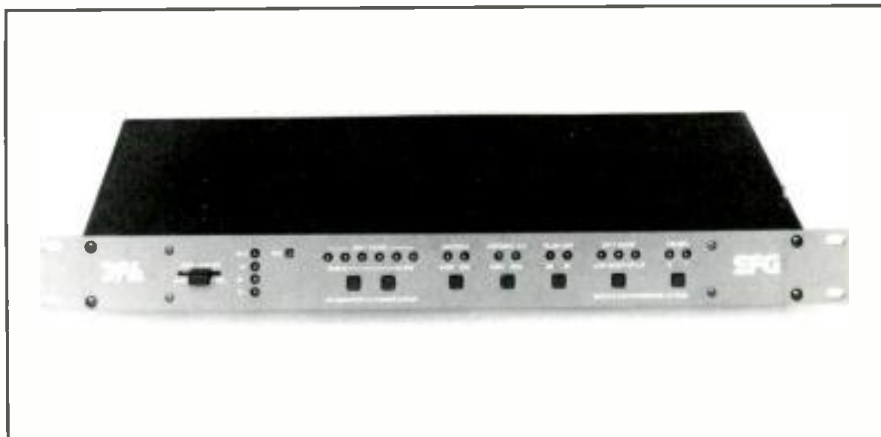
"CBS sprayed the RE18's gray to keep a consistent appearance. They were hooked up and, as expected, their internal shielding eliminated the electromagnetic field-pickup problem. Not only was the signal buzz-free, but the integrity of the audio met our strict technical and engineering standards."

"At the close of the debate, I gave Patrick McFadden of the White House Communications Agency three RE18's for his evaluation. What EV claims is true. That the RE18 eliminates problems in 'hostile environments' was ably demonstrated in Kansas City."



NEW DIGITAL REVERB SYSTEM

• Applied Research & Technology, Inc. recently introduced the new digital reverberation system—DR2. The DR2 is a true digital signal processor and is microcomputer controlled. This allows simple user commands to produce complex changes in the digital processing necessary to create reverberation. The system features a wide variety of user adjustable parameters. These include user presets, multiple room choices (plate, medium sized room, large hall), various pre-delay settings (0, 25msec, 50msec, and 75msec), adjustable high frequency damping, different room positions and multiple settings of decay time per room. It also features a front panel 'kill' which mutes the units output. In addition to the balanced mono input and stereo



output facilities, the DR2 has a mono mixed output with a front panel reverb level control. The unit is packaged in a sturdy single high rack and includes a one year limited warranty.

Mfr: Applied Research & Technology, Inc.
Price: \$1,095.

Circle 35 on Reader Service Card

UPGRADED POWER AMPS

• BGW Systems, Inc. has upgraded its Model 85 Series single rack mounted Broadcast Power Amplifiers. The new Model 85 now delivers 35 watts per channel driving 8 ohm loads. Along with the increased power output, the new amps feature black anodized aluminum front panel and improved noise characteristics. New, low feedback discrete circuit design results in exceptionally natural sound, coupled with the elimination of transient intermodulation distortion. A toroidal power transformer incorporated into the Model 85 design provides minimum size, weight, and low stray field and acoustic noise. Three versions of the Model 85 series are available. The Model 85 features single ended inputs that accept ¼-in. phone jacks for unbalanced applications. The Model 85-01 features high performance active balance input circuitry and XLR connectors, which allow BGW to guarantee a minimum of 70 dB common mode rejection. BGW's Model 85-06 has built in dual



input transformers that provide 15k ohms input impedance, and utilizes XLR connectors. Other features of the series include welded steel construction for maximum mechanical integrity and RFI shielding. Modular construction provides simplified servicing. A mono bridge switch allows high power single channel operation. Transient-free circuitry

prevents speaker pops or extraneous noise. All Model 85 Series amps include detented front panel gain controls and a headphone jack.

Mfr: BGW Systems, Inc.
Price: Model 85, \$449.
Model 85-01, \$499.
Model 85-06, \$584.

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HIGH ACCURACY MONITORS

• The Control Room Monitor by Acoustical Physics Laboratories of Atlanta, GA is a high accuracy, high output loudspeaker system designed for critical digital and analog control room monitoring applications. New advances in high power direct radiator drivers utilizing polypropylene cone materials combined with accurate crossover/driver alignments and lead dampened acoustic suspension enclosures have been incorporated into the Control Room Monitor. Each monitor is tri-amplified and incorporates four 12-inch polypropylene woofers, an 8-in. polypropylene midrange, a 2-in. upper midrange soft dome, and a 1-in. soft dome tweeter. The unequalized first arrival frequency response is from 20Hz-20kHz, ± 2 dB. Peak SPL output is 135 dB. Crossover frequencies are at 100Hz, 1200Hz, and 5kHz. Power requirements for tri-amplification are 600 watts per channel into 2 ohms (20Hz-100Hz), 400 watts per channel into 4 ohms (100Hz-1.200Hz), and 250 watts per channel into 8 ohms (5kHz-20kHz). State of the art FFT and analog Bruel & Kjaer instrumentation using the Bruel & Kjaer 4133 microphone is used to align all driver, crossover network and amplification parameters. An analysis of first arrival spectral accuracy, phase response, group delay, the room integrated response, and a three dimensional FFT reverberation mapping of the room is performed. The Control Room Monitor by Acoustical Physics Laboratories is 48-in. by 32-in. by 24-in. and is designed for recessed front wall installation. The



monitor comes complete with electronic crossover networks, on-site installation, setup, alignment and performance certification.

*Mfr: Acoustical Physics Laboratories
Price: \$9,500.*

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MICROPROCESSOR CONTROLLED AUDIO TEST SYSTEM

• TecPro Inc., the new U.S. subsidiary of Technical Products Ltd. (U.K.), has announced availability of their MJS401D Audio Test/Measurement System. The microprocessor controlled test set features one button set-up, and "intelligent" interlocking for speed and accuracy. An IEEE buss allows for optional computer control. Single or twin output plug-in oscillators, which employ 6802 microprocessors to interface with the micro-based MFS401D are available as accessories.

Mfr: TecPro Inc.



*Price: Basic system, \$3,999.
Single and twin oscillators,
\$962.50 and \$1,181.25
(respectively)*

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People, Places



• **Dolby Laboratories Inc.** also announced the appointment of **James Fitzpatrick** as film applications engineer. Fitzpatrick will assume responsibilities of technical support to the motion picture division, and technical liaison with film studios, distribution and production companies. Fitzpatrick possesses an extensive technical and management background in audio/video studio recording, most recently as Chief Engineer/General Manager of Westlake Audio, Inc. in Los Angeles.

• **Robert R. Boatman**, former head of retail advertising of Heath Company, has been named director of advertising and promotion for **Electro-Voice, Inc.**, a supplier of high technology mics, speakers, and electronics to professional and consumer markets worldwide. Boatman's retail advertising responsibilities at Heath Co. included the recent repositioning of Heath retail stores in the US and Canada. He also supervised the national and international publicity surrounding Heath's highly successful **HERO I**, the world's first affordable educational robot and was involved with corporate advertising and public relations efforts for both Heath Company and Heath International. Electro-Voice has main offices in Buchanan, Michigan, and factories in the US and Europe. EV is a subsidiary of Gulton Industries, Inc., a New York Stock Exchange Company with corporate headquarters in Princeton, NJ.

• **Roger Powell**, best known for his talents as a performing musician, composer, synthesist and instrument designer has joined the **Cherry Lane Technologies** team as director of product development. Powell, well-schooled as a keyboardist, first gained attention in the music business when he engineered Joe South's hit single "Games People Play" in 1969. With his dual proficiency in synthesizers and electronics, Powell joined the fledgling **ARP Company** in 1970 to design and promote new instruments. After release of his first solo album "Cosmic Furnace" in 1973, he left ARP to pursue a solo career. Then came a call from Todd Rundgren's **UTOPIA** to join the group as a keyboardist/synthesist—a position he's held for over ten years. Powell also toured and recorded with David Bowie in 1978, and in the same year released his second solo album *Air Pocket*. In 1979, Powell hand-built his own computer and synthesizer interface, and followed by developing several utility programs useful for music production. He designed two custom keyboard instruments as well: the **PROBE**, one of the earliest strap-on, remote keyboard controllers, and the **DATABOY**, a digital "sit-down" keyboard which was actually comprised of a music keyboard, standard computer and a digital oscillator card. **Cherry Lane Technologies** is a division of **CHERRY LANE MUSIC CO., INC.**, a leading publisher of sheet music and music books, pictorial biographies, recordings, and music magazines.

• **Frank K. Sterns** has been appointed **Acoustat** director of marketing and sales. Previously, for two years, Sterns was the national marketing coordinator of the **David Hafler Company** based in Pennsauken, NY. Before joining The David Hafler Company, he held similar positions with **AMP Marketing Systems** and **A&M Records**, as well as being an **Audio Consultant** for **Leo's Stereo**. A member of the **Audio Engineering Society**, Sterns is a **SAC** certified audio and video consultant.

• **Alpha Audio Corporation** of Richmond, Va. has appointed **David Walker** to the newly created post of director of operations and development. In this capacity he will oversee the marketing and development of new products and product lines for Alpha's various divisions.

• **Gregory A. Green** has been named **North American** sales manager for the professional products division of **dbx Inc.**, the audio electronics and signal processing firm. Prior to joining dbx, Green spent four years as the director of sales and marketing at **Ashly Audio** in Rochester, NY, where he was responsible for all foreign and domestic sales as well as for setting up the firm's financial control and sales tracking systems. His diverse background includes training as a musician and experience in retail sales.

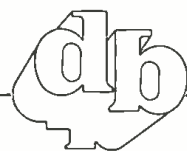
• **JBL Incorporated** has hired four engineers to work on the design and development of new professional sound products at the Northridge, California plant. **Drew Daniels** has been hired as the applications engineer for JBL and UREI. Daniels previously worked at JBL for several years as a senior research lab technician where he gained experience with laser interferometry and technical photography, time-energy measurements and acoustical testing methods. After leaving JBL, he worked at the Tascam division of Teac Corporation of America, Montebello, California and CBS' Fender musical instrument division, Fullerton, California. He also served as the

1983/84 chairman of the Audio Engineering Society's Los Angeles Section. After 20 years in the loudspeaker industry, **Roy Cizek** joins JBL as senior engineer. Cizek possesses an expertise in cabinet design which includes V-Groove and standard veneer enclosure design. Previous to JBL, Cizek was a design engineer with Altec Lansing Corporation, Oklahoma City, Oklahoma. As a new senior engineer at JBL, **Henry Martin** is involved in loudspeaker system design and the implementation of advanced testing methods. Additionally, Martin is engineering manager for JBL Professional Products. **Paul Apollonio** has been hired as an acoustical

engineer for JBL. Apollonio was the sole engineer for Genesis Physics Corporation and its subsidiary Avid in Newington, New Hampshire.

• **Andrew A. Brakhan** has been appointed President and Chief Executive Officer of Sennheiser Electronic Corporation. Sennheiser Electronic Corp. in NY is the exclusive US representative of Sennheiser, West Germany, manufacturer of condenser and dynamic mics, wireless mic systems, stereo headphones and boom sets, infrared transmitters and receivers, as well as test and measurement equipment.

... & Happenings



New Installments At Skyline

• Skyline Studios in New York recently announced the installation of a custom designed Solid State Logic SL 4000E Console. In addition, they have formed a collaboration with accomplished musician, **Peter Scherer**, the owner/operator of the new on-premises Synclavier II Digital Music System. The SSL Console has a 56 input mainframe fitted with 40 channels, the Studio Computer, and Total Recall. Built into the producer's desk are vintage Neve and API equalizers. Eight miles of new wiring and state-of-the-art gold plated DL connectors have been incorporated into the technical upgrading of the studio. Skyline's completely remodeled control room has been enhanced for personal comfort while maintaining the integrity of the previous acoustic environment. Construction of a Synclavier pre-production suite at the studio's 5000 square foot facility has also been completed. **Peter Scherer**, who has worked with Hall & Oates, Nile Rodgers, Kashif, and many others over the past three years, has created an outstanding library of orchestral samples, synthesized sounds, and unique special effects. His experience has put him in a position to fully exploit the potential of the Synclavier system.

New Equipment For Trutone

• Trutone Records Disc Mastering Labs of Haworth, NJ, have announced the acquisition of a Sony PCM-1610 digital processor, a Sony BVU-800AD ¼-in. U-Matic recorder, a Studer DAD-16 digital delay, a Sony PCM-701 digital processor with Audio and Designs levels 1, 2, and 3 modifications and both Beta and CHS recorders. The new equipment will allow the firm to create, compile, sequence, and time code compact disc masters from both digital and analog sources. Analog master lacquers and tape copies can be created from 1610 and PCM F1/701 masters. The Audio and Designs modifications of the 701 enables a direct interface to the Studer delay line. This interface allows for the direct cutting of master lacquers from the F1/701 format. Furthermore, copies may be made from the 1610 format to the F1/701 format and from the F1/701 format to the 1610 format entirely in the digital domain.

New West Coast Office For Solid State Logic

• Solid State Logic has opened a new sales, service, and training facility in Hollywood, CA. The office is headed by **Andy Wild**, who was recently appointed vice president of marketing for SSL Inc. Previously, Wild

served as the UK and Far East sales manager of SSL-UK. SSL's new offices include a complete audio for video post-production demonstration and training facility, equipped with an SL6000E Series Stereo Video System. Client training will be supervised by SSL's new West Coast sales engineer **Dave Colley**, who joins the company from Producers Color Services in Detroit, where he served as chief audio-for-video mixer.

MCI Facility Renamed SPCC

• Sony Corporation of America has completed the integration of its MCI manufacturing facility in Ft. Lauderdale, FL, into Sony's worldwide manufacturing operations by renaming the facility as Sony Professional Products Company. Since the company's acquisition, major programs have been implemented to design and manufacture the most advanced professional equipment available today, including digital audio recording and sound control systems. Sony Professional Products Company (formerly MCI, Inc.) is a worldwide leader in the manufacture and sale of professional recording equipment. Founded in 1955 and acquired by Sony Corporation of America in 1982, the company is the largest manufacturer of multi-track recorders and studio mixing consoles in the US.

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